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DRAFT INTEGRATED FEASIBILITY REPORT AND ENVIRONMENTAL ASSESSMENT NOTICE OF AVAILABILITY

U.S. Army Corps of Engineers
Planning, Environmental and Cultural Resources Branch
4735 E Marginal Way S
Public Notice Date: November 4, 2025
Seattle, WA 98124-2385

Expiration Date: December 4, 2025
Reference: PMP-25-07
Name: Section 14 Grays Harbor Detention Facility Emergency Streambank and Shoreline Protection Project

Interested parties are hereby notified that the U.S. Army Corps of Engineers, Seattle District (USACE) has prepared, pursuant to the National Environmental Policy Act (NEPA), a draft Integrated Feasibility Report/Environmental Assessment (IFR/EA) for Section 14 Grays Harbor Detention Facility Emergency Streambank and Shoreline Protection Project. The IFR/EA outlines the feasibility phase of the study, including the development and evaluation of shoreline protection options and the potential environmental impacts of implementing the recommended measures. The study is authorized under CAP, Section 14 of the 1946 Flood Control Act, as amended. The purpose of this notice is to solicit comments from interested persons, groups, and agencies on USACE's proposed action under NEPA.

COMMENT AND REVIEW PERIOD

USACE invites submission of comments on the environmental impact of the proposed action. Comments will be considered in determining whether it would be in the best public interest to proceed with the proposed project. USACE will consider all submissions received before the expiration date of this notice. The nature or scope of the proposal may be changed upon consideration of the comments received. If significant effects on the quality of the human environment are identified and cannot be mitigated for, USACE would initiate an Environmental Impact Statement (EIS) and afford all the appropriate public participation opportunities attendant to an EIS.

COMMENT SUBMISSION

Submit comments to this office, Attn: Planning, Environmental, and Cultural Resources Branch, 4735 E Marginal Way S, Seattle, WA, 98124-2385, no later than 30 days after the posting of this notice to ensure consideration. Comments not received within the comment period are deemed unexhausted and therefore forfeited.

In addition to sending comments via mail to the above address, comments may be e-mailed to zachary.m.wilson@usace.army.mil. This Notice and the Draft IFR/EA can be found online at the link below.

Project Name: Section 14 Grays Harbor Detention Facility Emergency Streambank and Shoreline Protection Project

http://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/

Posting Date: November 4, 2025 End of Comment Period: December 4, 2025

Grays Harbor Detention Facility
Emergency Streambank and Shoreline Protection
Continuing Authorities Program Section 14
EAXX-202-0-G3-O-1759145337

Draft Integrated Feasibility Report/Environmental Assessment
Aberdeen, Grays Harbor County, Washington
November 2025

U.S. ARMY

US Army Corps of Engineers

Draft Integrated Feasibility Report/Environmental Assessment

Grays Harbor Detention Facility Emergency Streambank and Shoreline Protection Continuing Authorities Program (CAP) Section 14

Aberdeen, Grays Harbor, Washington

Responsible Agency: The responsible agency for this Civil Works project is the U.S. Army Corps of Engineers, Seattle District.

In accordance with the National Environmental Policy Act (NEPA), this draft Environmental Assessment (EA) evaluates the potential effects of the proposed Grays Harbor Detention Facility Emergency Streambank and Shoreline Protection.

This draft document is available online for public review and comment at:

http://www.nws.usace.army.mil/Missions/Environmental/Environmental-Documents/

Please send questions and requests for additional information to:

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ACRONYMS AND ABBREVIATIONS

APE	Area of Potential Effects	LWM	Large Woody Material
AAEQ	Annual Average Equivalent Costs	MMPA	Marine Mammal Protection Act
ASA(CW)	Assistant Secretary of the Army for Civil Works	MMT	Million Metric Tons
BA	Biological Assessment	NAAQS	National Ambient Air Quality Standards
BCR	Benefit-Costs Ratio	NED	National Economic Development
BMP	Best Management Practices	NEPA	National Environmental Policy Act
CAP	Continuing Authorities Program	NMFS	National Marine Fisheries Service/NOAA Fisheries
CFR	Code of Federal Regulation	NOAA	National Oceanographic and Atmospheric Administration
CWA	Clean Water Act	NPDES	National Pollution Discharge Elimination System
CZMA	Coastal Zone Management Act	NRCS	Natural Resources Conservation Service
D&I	Design and Implementation Phase	NWD	USACE Northwestern Division
dB	Decibel	OMRR&R	Operations, Maintenance, Repair, Rehabilitation, & Replacement
DPS	Distinct Population Segment	OSE	Other Social Effects
EA	Environmental Assessment	P&G	Economic and Environmental Principles and Guidelines
Ecology	Washington State Department of Ecology	P.L.	Public Law
EFH	Essential Fish Habitat	PDT	Project Development Team
EIS	Environmental Impact Statement	RECONS	Regional Economic System

EO	Executive Order	RED	Regional Economic Development
EPA	Environmental Protection Agency	SHPO	Washington State Historic Preservation Office
EQ	Environmental Quality	sp./spp	Species (singular and plural)
ER	Engineering Regulation	SRKW	Southern Resident Killer Whale
ESA	Endangered Species Act	TPCS	Total Project Cost Summary
FONSI	Finding of No Significant Impact	TSP	Tentatively Selected Plan, (Preferred Alternative)
FWOP	Future Without Project	U.S.C	United States Code
FWP	Future With Project	USACE	U.S. Army Corps of Engineers, Seattle District
FY	Fiscal Year	USFWS	United States Fish and Wildlife Service
GHG	Greenhouse gases	WQC	Water Quality Certificate
HTRW	Hazardous, Toxic, and Radioactive Waste	WSDOT	Washington State Department of Transportation
IFR/EA	Integrated Feasibility Report and Environmental Assessment		
JDC	Juvenile Detention Center		

Executive Summary:

This draft Integrated Feasibility Report and Environmental Assessment (IFR/EA) presents the findings of the CAP Section 14 Grays Harbor Detention Facility Emergency Streambank and Shoreline Protection Project (Project) feasibility study and environmental assessment. In this project, the Detention Facility is referred to as the Juvenile Detention Center (JDC), located in Aberdeen, Washington. Prepared by the Seattle District, U.S. Army Corps of Engineers (USACE), the report outlines the feasibility phase of the study, including the development and evaluation of shoreline protection options and the potential environmental impacts of implementing the recommended measures. The study is authorized under CAP, Section 14 of the 1946 Flood Control Act, as amended. Grays Harbor County is the Non-Federal Sponsor (NFS) for the project.

The study focuses on approximately 240 linear feet of eroded streambank along the Chehalis River, directly adjacent to the JDC. The JDC is located at 103 Junction City Road in Aberdeen, Grays Harbor County, Washington at coordinates 46.977667, -123.780306. The site is located on the right bank of the Chehalis River, near its confluence with Elliot Slough, about 3.5 miles upstream from the entrance to Grays Harbor and the Pacific Ocean. Operated by the Grays Harbor County Juvenile Department, the JDC provides a range of services to youth referred by law enforcement, including detention, probation, diversion, education, and court support. The goal of the Project is to reduce the risk of damage to the facility caused by ongoing shoreline erosion. This erosion is driven by a combination of tidal currents, fluctuating river flows, seasonal flooding, and wind-generated waves. Of particular concern is the perimeter security fence, which is at immediate risk of being compromised due to continued erosion.

This draft IFR/EA summarizes existing conditions in the study area, formulates, and compares different shoreline protection measures, and describes the environmental impacts of each alternative. It identifies Alternative 3 (Terraced Riprap Berm) as the preferred option, also known as the Tentatively Selected Plan (TSP). The TSP includes stabilization of 240 linear feet of streambank using riprap with a vegetated terrace on the slope, willow plantings in the riprap, and additional plantings on the upland site. The TSP best meets the goals of protecting the streambank in the study area and supports the objective of the NFS. The TSP is the least cost alternative and it strikes a balance between preventing erosion damage to the JCD perimeter security fence and buildings, while maintaining the existing exercise yard space, and minimizing and mitigating environmental impacts. The design level for this phase (feasibility) is 35 percent. All further maturation of the design will be in the next phase.

The estimated project first cost to design and construct the TSP is $988,000. The fully funded total project cost is $1,088,000, which includes the project first costs plus the inflation and expected cost increases through the midpoint of construction. If the Project proceeds, the NFS will provide 35 percent of the design and construction funding. Once construction is finished, the NFS will take full responsibility for all future operation and maintenance of the Project.

1. INTRODUCTION

USACE began preparing this draft IFR/EA on May 21, 2025, in compliance with the National Environmental Policy Act (NEPA), as amended (42 U.S.C. § 4321 et seq.) and USACE regulations for NEPA implementation (33 CFR 230). In accordance with Section 102(C) of NEPA, and specific USACE planning regulations which are cited as relevant throughout the IFR/EA, this report evaluates the potential environmental impacts of streambank protection measures adjacent to the Grays Harbor JDC. The proposed action is carried out under the authority of the CAP, Section 14 of the Flood Control Act of 1946, as amended.

1.1 USACE PLANNING PROCESS

This document is a draft IFR/EA. The planning process used in this study follows USACE Policy for Conducting Civil Works Planning Studies, as outlined in Engineer Regulation (ER) 1105-2-103. The purpose of the IFR/EA is to identify a technically feasible, environmentally acceptable, and least-cost alternative that is less expensive than relocating the threatened facility. The EA portion of the report presents information on the potential environmental effects of the proposed alternatives and ensures that environmental considerations are integrated into the decision-making process. The six steps of the USACE planning process correspond with key requirements of the NEPA. Table 1-1 provides an overview of these planning steps, along with the associated document chapters and NEPA elements.

Table 1-1: Overview of IFR/EA

Planning Steps	Analogous NEPA Requirement	IFR/EA Chapter
Specify Problems and Opportunities	Purpose and Need for Action	Chapter 2
Inventory and Forecast Conditions	Affected Environment	Chapter 3
Formulate Alternative Plans	Alternatives and Proposed Action	Chapter 4
Evaluate Effects of Alternative Plans	Environmental Consequences	Chapter 5
Compare Alternative Plans	Alternatives Considered and Eliminated	Chapter 6
Select Recommended Plan	Agency Preferred Alternative	Chapter 7

1.2 STUDY AUTHORITY

This Project is authorized under the CAP, Section 14 of the Flood Control Act of 1946

(P.L. 79-526), as amended. CAP Section 14 authorizes USACE to plan, design, and execute emergency streambank and shoreline erosion protection projects in partnership with a NFS through a cost-sharing agreement. For this Project, Grays Harbor County serves as the NFS. Eligible work under Section 14 includes protecting public or nonprofit facilities—such as highways, bridge approaches, schools, hospitals, churches, and other public infrastructure—threatened by erosion. However, erosion caused by the facility's own design, poor drainage, or lack of maintenance is not eligible, nor is repair of the facility itself. Under 33 U.S.C. § 701r, emergency work may be undertaken when the Chief of Engineers determines it is warranted. Assistance through Section 14 is subject to available funding, and a project may proceed to construction only after it is found to be technically feasible, environmentally acceptable, and economically justified.

1.3 LEAD FEDERAL AGENCY AND NFS

USACE serves as the lead Federal agency for the Project. Grays Harbor County (County), Washington, is the NFS for the study. On May 19, 2022, the County submitted a formal request for assistance under Section 14 to address streambank erosion threatening the JDC. To initiate the feasibility phase, USACE and the County entered into a Feasibility Cost Share Agreement on July 9, 2024. During the feasibility phase, the first $100,000 of study costs is fully federally funded, with no contribution required from the NFS. Any costs exceeding that amount are shared equally between USACE and the NFS.

1.4 PROJECT LOCATION AND STUDY AREA

The JDC is located at 103 Junction City Road in Aberdeen, Grays Harbor County, Washington (coordinates: 46.977667, -123.780306). The site is located on the right bank of the Chehalis River, near the confluence with Elliot Slough, approximately 3.5 miles upstream from the entrance to Grays Harbor and the Pacific Ocean (see Figures 1-1 and 1-2 below).

1.5 PURPOSE AND NEED

The purpose of this Project is to reduce the risk of damage to the JDC caused by ongoing streambank erosion in a manner that is economically feasible and environmentally acceptable. A combination of tidal activity, fluctuating river flows, seasonal flooding, and wind-driven wave action has contributed to the progressive loss of shoreline near the facility. Erosion is occurring at an estimated rate of 1 to 2 feet per year. In 2019, the streambank was approximately 8 feet from the JDC's perimeter security fence; by 2022, that distance had decreased to just 6 feet. Continued erosion poses a threat to the integrity of the fence and could compromise the facility's security. Additionally, on-site stormwater infrastructure may be affected, and without intervention, the JDC building itself could be at risk.

This report evaluates the streambank erosion issue, documents existing site conditions, projects future conditions without intervention, and compares conceptual alternatives to address the problem. It identifies a preferred alternative for emergency streambank protection. The findings and recommendations presented in this report are subject to

review and approval by the USACE, Northwestern Division (NWD) Commander. If approved, the Project will advance to the Design and Implementation (D&I) phase.

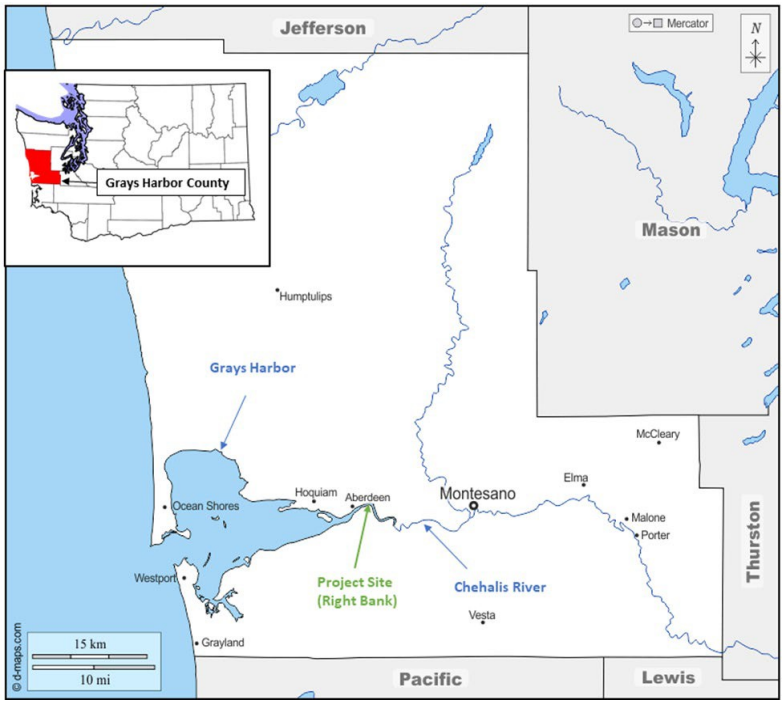

Figure 1-1. Study Region.

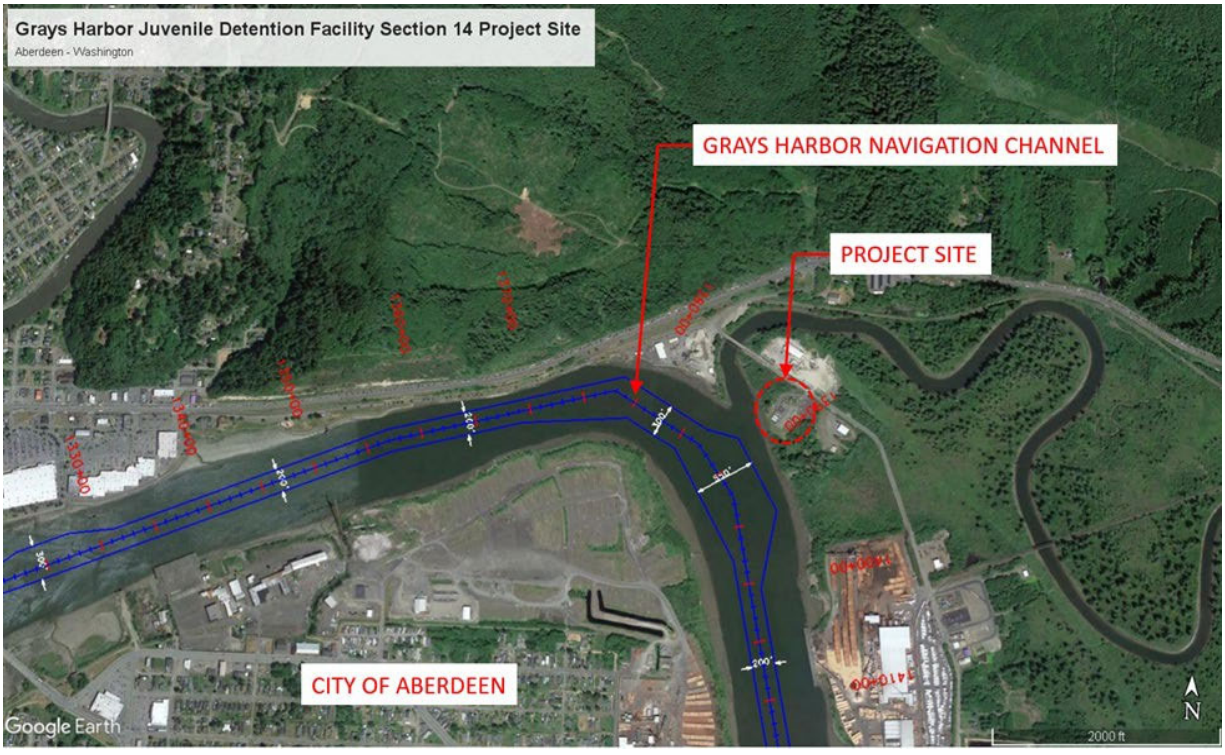

Figure 1-2. Project Vicinity.

1.6 PUBLIC AVAILABILITY AND AGENCY COORDINATION

USACE issued a Public Notice of Availability announcing the release of the draft IFR/EA, along with a draft Finding of No Significant Impact (FONSI), for a 30-day public comment period from November 3 to December 3, 2025. This document serves as the draft IFR/EA and includes the draft FONSI in Appendix B.1. All comments received during the public review period will be considered, and responses will be incorporated into the final IFR/EA.

2 PROBLEMS AND OPPORTUNITIES

2.1 PROBLEMS

Streambank erosion along the Chehalis River adjacent to the JDC has already compromised several storm drainage pipes and is actively threatening the facility's perimeter security fence, which encloses the outdoor yard used by detainees. Continued erosion beyond the fence line would place the JDC buildings themselves at risk, potentially affecting both structural integrity and operational security.

2.2 OPPORTUNITIES

Opportunities refer to additional benefits that may result from addressing the primary problem. Under the authority of CAP Section 14, USACE is authorized to respond to streambank and shoreline erosion that threatens public infrastructure. For this Project, the primary objective is to prevent erosion-related damage and protect the perimeter security fence of the JDC, while also meeting environmental requirements. Streambank protection measures may incorporate nature-based features that support habitat needs for species listed under the Endangered Species Act (ESA), while also benefitting other fish and wildlife. In addition to protecting the security fence and maintaining the site safety, the Project may also help preserve the existing exercise yard and reduce long-term risk to the JDC buildings.

2.3 OBJECTIVES

Planning objectives describe the intended outcomes of the study by addressing identified problems and leveraging potential opportunities within the Project's planning horizon. Objectives are designed to be specific, measurable, attainable, relevant, and timely. The Federal and Project objectives are highlighted below. Evaluation of the alternatives in relation to the objectives can be found in Chapter 5.

2.3.1 FEDERAL OBJECTIVE

The 2007 Water Resources Development Act established the Federal Objectives as outlined in Section 1-19 of ER 1105-2-103. These objectives guide the planning and evaluation of federal water resource investments to ensure alignment with national priorities. Projects must promote economic development, protect the environment, and reflect responsible use of public resources by:

> (1) Seeking to maximize sustainable economic development;
>
> (2) Seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and
>
> (3) Protecting and restoring the functions of natural systems and mitigating

any unavoidable damage to natural systems.

2.3.2 GUIDING PRINCIPLES

The Guiding Principles represent the core concepts the Federal Government aims to advance through its investments in water resources—both now and in the future. As outlined in Section 1-20 of ER 1105-2-103, and drawn from the CEQ 2014 Principles, Requirements, and Interagency Guidelines, these principles are intended to promote:

- Healthy and resilient ecosystems.
- Sustainable economic development.
- Floodplains.
- Public safety.
- Watershed approach.

2.3.3 PROJECT OBJECTIVE

The project objective is to reduce the risk of damage to structures and infrastructure at the JDC caused by shoreline erosion from river, tributary, and tidal hydraulic forces, further intensified by storm- generated wave action.

2.4 CONSTRAINT

During the development of measures and alternatives, USACE established planning constraints to guide the formulation process. Each alternative is evaluated based on whether its implementation would comply with these constraints. A non-Federal sponsor requirement that serves as a study constraint for this Project is to maintain a 15-foot visual zone extending outward from the perimeter fence of the JDC. This zone must include a clear path and low-growing grass or shrubs to ensure unobstructed visibility for facility security access.

The path itself does not need to be 15 feet wide; however, there must be sufficient space for guards to walk the perimeter and operate small equipment, such as lawnmowers, along the fence line. The top of the riprap slope may extend into the 15-foot zone, but any vegetation within this must remain low-growing. In addition, the Project must be feasible in terms of access, implementation, and cost. It should be appropriately scaled for a Section 14 CAP project and remain within the capabilities of the NFS.

3 EXISTING AND FUTURE WITHOUT PROJECT (FWOP)CONDITIONS

This chapter describes the current conditions at the JDC and outlines the anticipated future conditions if USACE takes no action under the CAP Section 14 authority to stabilize the streambank. Under this scenario, current conditions are assumed to persist without USACE intervention. This section does not assume whether or when the NFS might relocate the facility or whether the NFS will undertake repairs without USACE assistance.

It also identifies the key environmental and socio-economic factors relevant to the study area.

3.1 PERIOD OF ANALYSIS

The planning horizon for this study is 50 years, beginning from the implementation of the selected alternative (2028) and extending through 2078. The period of analysis follows USACE guidance provided in Engineering Regulation (ER) 1105-2-103.

3.2 EXISTING STREAMBANK CONDITIONS

Site History: Based on the Natural Resources Conservation Service (NRCS) soil survey, the JDC facility is located in an area that is presumed to have been a wetland or tidal flat in the past. The land was later filled with dredged material to raise the surface level. This fill consists of unconsolidated sandy and loamy river sediments, which are highly susceptible to erosion when exposed to hydraulic forces from tidal changes and river flows.

Hydrodynamic Forces: The streambank at the JDC is affected by dynamic river flows, tides, and wind-generated waves. Erosive forces occur when downstream river flows meet tidal inundation, which can reverse the river's direction during rising tides. Elliot Slough joins the Chehalis River directly in front of the Project site. Eddies and turbulence that form at this confluence may contribute to streambank erosion at the JDC, along with wind-generated waves approaching from the west and the south.

Observed Erosion and Repairs: The eroded vertical bank at the JDC is approximately six feet tall, measured from the riverbed to the top of the bank. The bank line is scalloped, curving in and out, and comes within a few feet of the JDC perimeter fence. Two deep cuts have formed where stormwater outfall pipes discharge (Figure 3-1). The riverbank near these outfalls has receded more than 11 feet compared to the bank upstream of the facility. Several years ago, the NFS placed sandbags in sinkholes beneath the pipes, but these efforts had little to no success in slowing the erosion. Figure 3-2 shows one of the outfalls after the NFS's second temporary repair in 2024, when a riprap-filled trench was installed upland of the erosion front. This 2024 repair is currently holding back erosion, but it is not intended as a long-term solution. Just downstream of the Project site, the NFS placed riprap along the shoreline about ten years ago, which has remained stable and protective of the bank in that area.

Figure 3-1: Undermined Outfall Pipe

Figure 3-2: Sink Hole Around Pipe Following the NFS's 2024 Emergency Project.

3.3 GEOLOGY AND HYDROLOGY

The Project site is located in a tidally influenced area at the confluence of Elliott Slough and the Chehalis River. The Chehalis River is the largest tributary to Grays Harbor, supplying over 80 percent of the estuary's freshwater (USACE 1989). It begins in the Willapa Hills, the Black Hills, and the lowlands east of I-5 near Centralia. Since it has no

glacial source, it is the largest drainage basin in Washington that is fully contained within the state. Average yearly rainfall ranges from 43 inches near Chehalis to more than 250 inches in the headwaters of the Wynoochee and Humptulips Rivers (Gendaszek, 2011). The river flows west through mostly conifer forests and open farmland, and it is the main source of sediment carried by water into the inner parts of Grays Harbor.

Appendix A gives a detailed look at wind-driven waves and river flow conditions at the site. Because the site is close to the Pacific Ocean and sits along the streambank, it is affected by both coastal and river water movement. The lower part of the river experiences erosion from the rise and fall of tides, as water elevation changes with the tidal cycle. Tides in the area usually range from 8 to 10 feet, and spring tides can reach differences of 12 to 13 feet between low and high tide. Higher river flows during certain seasons and occasional floods also add to the ongoing erosion of the streambank.

Immediately north of the JDC is Elliott Slough, a small stream that flows into the Chehalis River in a way that creates opposing water movements at the meeting point. This confluence is close enough to the Project site that swirling water patterns—like eddies and vortexes—formed by these opposing flows may cause further slope erosion. Another factor is wave impact. Wind waves form when wind blows across the surface of water over long distances, called wind fetches. The main winds at the site come from the west and south, and more study is needed to understand how much they affect the area.

During tidal flow, the NFS has observed turbulence in front of the Project site, where saltwater currents push inward against the outflows from the Chehalis River and Elliott Slough (Mark Cox, pers. comm.). Under certain conditions, salinity at the site can go above 10 parts per thousand (ppt) (Beverage and Swecker 1969). Overall, the site is shaped by river flows from the Chehalis River basin, daily tides of about 9.8 feet, and tidal prisms—the amount of water that leaves the estuary during ebb tide.

3.4 GEOLOGY AND HYDROLOGY IN THE FWOP CONDITIONS

Erosive forces described in Section 3.3 above are expected to continue, with tides remaining cyclical in nature and river flows and wind-generated waves varying based on seasonal severity. Winter brings the strongest winds from storms arriving from the Pacific Ocean, which also contribute to elevated river flows during periods of heavy precipitation. In spring, rain events combined with snowmelt further contribute to river-driven erosion. Tidal influence and river flows are expected to remain the primary drivers of streambank erosion, with wave impacts playing a contributing role during high tides.

The climate in the Pacific Northwest is changing over time. Since 1900, average annual temperatures have increased by two to three degrees Fahrenheit, with more precipitation now falling as rain rather than snow. Extreme flood and high wind events are also occurring more frequently (USDA 2025). These storm events will continue to threaten the stability of the shoreline at the JDC and may increase the rate of erosion over time or result in catastrophic loss of the streambank during an extreme event.

3.5 SOILS

The JDC is located on land that was once low-lying tidal flats or wetlands. This area was filled with dredged river sediment, likely several decades ago. According to the NRCS Web Soil Survey, the soil is generally made up of sandy and loamy river dredgings and is classified as non-hydric. This soil unit does not have a standard profile, as it consists of locally dredged material that varies depending on where it came from. Because of its composition, the soil may be more prone to erosion.

During a site visit along the eroding shoreline, visual observations showed that the upper six feet of soil consisted of silty clay with trace amounts of sand, or clayey silt with trace sand.

A soil core was collected in July 2025 and will be analyzed during the Design and Implementation (D&I) phase to better understand site-specific characteristics. The results will help refine the design in the next phase. While the overall design of the TSP is expected to remain the same, minor adjustments may be made—for example, changes to riprap size, thickness, or the type of underlayment material. The undeveloped land next to the JDC is mapped as tidal flats with silty clay loam soil. This unit is classified as hydric and supports wetland conditions.

3.6 SOILS IN THE FWOP CONDITIONS

Without implementation of the proposed Project, soils would be lost through continued streambank erosion and would likely result in undermining the security fence within the next one to ten years, depending on the severity of future storms. Continued erosion of soils could eventually threaten the buildings.

4 PLAN FORMULATION

4.1 PLANNING FRAMEWORK

USACE policy for conducting civil works planning studies is outlined in ER 1105-2-103. This policy requires a systematic approach to developing alternative plans that support Federal objectives. To guide sound decision-making—both in creating alternatives and selecting a final plan—the process must be structured and repeatable. This chapter presents the outcomes of that process.

Alternatives were developed based on identified problems and opportunities in the study area, along with the study's objectives and constraints. Each alternative was evaluated using the four criteria established in the P&G: completeness, effectiveness, efficiency, and acceptability. Figure 4-1 summarizes the plan formulation process, which is explained in detail throughout this chapter.

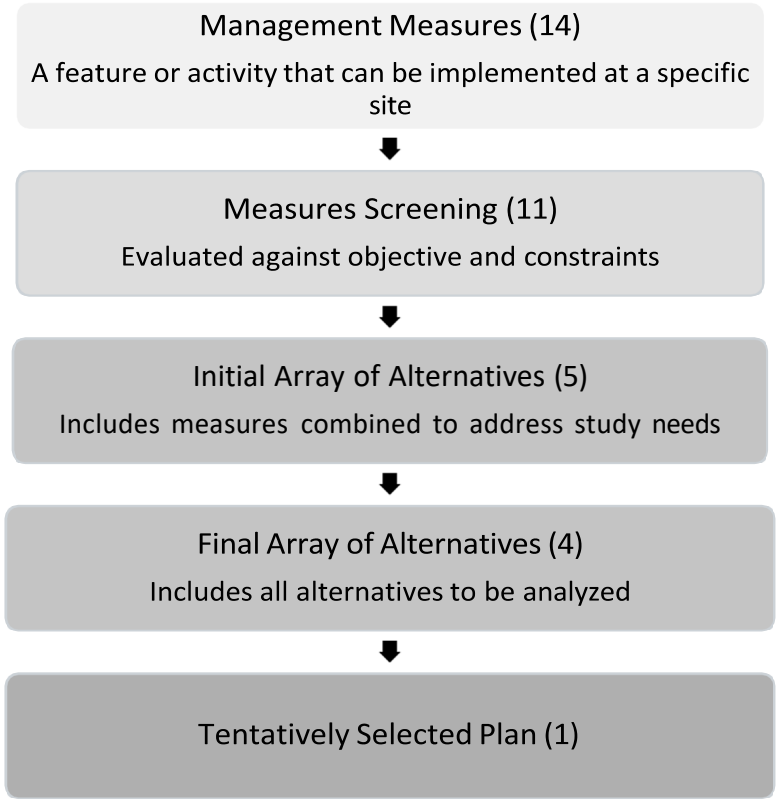

Figure 4-1: Plan Formulation Process

Under CAP Section 14, as part of the economic analysis, USACE must compare the cost of relocating the JDC with the cost of other alternatives and identify the lowest-cost option that effectively resolves the problem. NEPA further requires Federal agencies to assess the potential environmental impacts of proposed actions and any reasonable alternatives

before proceeding with a major Federal action. NEPA also requires inclusion of a "no action" alternative, identification of the preferred alternative—known as the TSP— and a brief summary of alternatives that were considered but eliminated, including the reasons for their dismissal.

Because this report serves as both a feasibility study and an environmental assessment, the definition of the "No Action" alternative differs between the economic analysis and the NEPA evaluation. For economic analysis purposes, the No Action Alternative (Alternative 1) assumes that the NFS would eventually need to relocate the JDC to maintain services if USACE does not address the erosion. If USACE constructs a levee to armor the stream bank, relocation costs would be avoided. These avoided costs are treated as cost-saving benefits and are compared against the project costs of each alternative to identify the least-cost option, which is then selected as the TSP. Relocation costs are included solely to support the economic justification for pursuing a CAP Section 14 project, in accordance with EP 1105-2-58 (29)(d). However, as explained in Chapter 5, relocation is not considered a NEPA alternative under CAP Section 14. If the NFS relocates the JDC, services would continue at a different location, and the CAP Section 14 project would not be implemented. For NEPA purposes, the No Action Alternative assumes that USACE does not carry out the project, and therefore, the environmental assessment does not evaluate any effects associated with relocation.

4.2 MANAGEMENT MEASURES CONSIDERED

As part of the feasibility study, the PDT developed management measures based on the study's objectives and constraints. These measures form the basis for creating and evaluating alternative plans. Table 4-1 provides a summary of the management measures considered in this study.

Table 4-1: Management Measures Considered

Measures	Definition	Expected outcomes
Relocate JDC	Move JDC to a location out of the 100-year floodplain	Shoreline erosion would no longer be an issue.
Install riprap armoring.	Armor the shoreline with riprap.	Protection of the streambank and the fence in its current configuration. Degrades water quality and shoreline habitat conditions for fish and wildlife. Provides future protection of the detention center buildings.
Plant shrubs.	Planting native vegetation that can survive site conditions.	Stabilizes soils and mitigates impacts from new shoreline armoring to water quality, fish and

		wildlife, and ESA.
Anchoring / loose large woody material (LWM)	Anchoring large wood along the shoreline.	Increases channel roughness and complexity. Reduces the direct impact of waves on the shoreline and reduces the direct impact of waves on the shoreline and minimizes impacts from the new shoreline armoring to water quality, fish and wildlife, and ESA-listed species
Undulating shoreline	Creating undulations of the shoreline	Increases channel roughness and complexity. Reduces the direct impact of waves on the shoreline and mitigates impacts from new shoreline armoring to water quality, fish and wildlife, and ESA.
Terracing of riprap with plantings	Creating terraces on the river side of the bank	Increases channel roughness and complexity. Protects the streambank and provides fish habitat features (plantings on terrace) and high-water refuge for fish.
Laying back shoreline with riprap	Decreasing the angle of the slope to the river.	Protects the streambank with a more natural slope providing better fish habitat conditions than a steeper slope (reduced streamflow velocity). Also provides terrace feature for fish habitat. Requires moving perimeter fence and temporary classroom buildings. Reduces size of exercise yard.
Relocate temporary classrooms	Move the temporary classrooms to allow for laying the streambank back.	Allows more flexibility with fence realignment.

Move fence landward	Realign fence so that it is set further back from advancing erosion.	Would create space to enable laying back of shoreline. Would reduce available exercise yard space at the JDC
Shorten discharge pipes	Cut discharge pipes back to prevent their deformation from loss of underlying soil.	Enables drainage pipes to continue to function but would not address erosion threatening to undermine the fence and buildings.
Fish mix / fish friendly rock	Adding small gravel and sand mixture within the larger i riprap boulders and at the base of the slope on the riverbed.	Fills interstitial spaces where predator fish may hide and feed on smaller out-migrating salmon.
Reroute drainage pipes	Move all or portions of drainage pipes away from erosion that is undermining them.	Enables drainage pipes to continue to function but would not address erosion threatening to undermine the fence and buildings.
Sheet pile wall	Install a sheet pile wall to protect the streambank.	Protects the uplands from further erosion. Degrades fish habitat by removing all natural streambank habitat features.
Geotextile	Geotextile is a cloth anchored at the toe and head into native soil along the shore.	Protects the streambank and minimizes soil loss.
In-kind Offsite Mitigation	Restoration of shoreline habitat through removal of riprap and planting native vegetation at a separate location.	Offsets environmental impacts of installing 2:1 riprap slope with minimal on-site habitat features.

4.3 SCREENING OF MEASURES

Screening is the process of eliminating management measures that do not meet the planning criteria and will not be carried forward for further consideration. These criteria

are tailored to the specific planning study and are based on the study's objectives, constraints, and identified opportunities within the Project area. The PDT applied the following criteria to screen the measures:

- Must contribute to the planning objective of reducing the risk of damage to structures and infrastructure.
- Must not violate the 15-foot visual clear zone required for security purposes.
- Must be feasible in terms of access, implementation, and cost.
- Must be appropriately scaled for a Section 14 CAP project and within the capabilities of the NFS.

Each measure was evaluated against these criteria. Measures that did not meet the requirements were screened out. Table 4-2 summarizes the measures that were not carried forward and provides the rationale for their elimination.

Table 4-2: Measures Screened Out

Measure	Reason excluded
Undulating Shoreline	The length of the Project is too short for this to be effective.
Sheet pile wall	Prohibitive cost and concerns about the tie ins.
Fish mix / fish friendly rock	Not technically effective in the Project location. There is no natural sediment source to replace any material that might wash away. The natural substrate in the project area is mudflat. Gravels no not naturally occur at this location.
Reroute drainage pipes	There is no feasible way to route the pipes in a different way.

4.4 FORMULATION OF ALTERNATIVES

As part of the feasibility study, the PDT developed an initial array of alternatives to address streambank erosion threatening the JDC. These alternatives were formulated based on identified problems, opportunities, and constraints, and were evaluated using measures listed in Table 4-3 and the four criteria outlined in the Economic and Environmental Principles and Guidelines(P&G): completeness, effectiveness, efficiency, and acceptability. Following this evaluation, a final array of alternatives was selected for detailed analysis.

4.4.1 INITIAL ARRAY OF ALTERNATIVES

The following alternatives were developed for further analysis. Each design alternative--except the No Action alternative—includes “mitigation” measures to avoid, minimize, and/or offset negative environmental effects associated with a proposed action. Mitigation is a catch-all term that refers to a range of actions and design features, such as construction best management practices that help avoid or reduce adverse environmental effects, planting native vegetation to replace what was disturbed during construction, and enhancing existing habitat by planting trees and shrub where they are missing and installing large woody material in the river to improve habitat. Mitigation actions can take place onsite or offsite and may be in-kind or out-of-kind. In this report, the terms mitigation/mitigate and offsets/offset are used interchangeably. The term “compensatory mitigation” is used specifically in the context of Clean Water Act (CWA) compliance, where mitigation measures are an explicit requirement. No compensatory mitigation is proposed for any of the alternatives at this time because coordination under the CWA (see Section 8.4) is still ongoing. In addition, consultation under the ESA is also in progress. These consultations with the resource agencies may result in additional requirements that could alter the design features of any or all alternatives. To account for these potential requirements, the cost estimates for the alternatives include contingency funds for compensatory mitigation and ESA-related actions. Any additional requirements will be incorporated into the final Project.

Alternative 1: No Action (Relocate JDC)

The No Action /Relocate JCD alternative serves as the baseline for comparing Future with Project (FWP) alternatives over a 50-year planning horizon. Because this report serves as both a feasibility study and a NEPA document, this alternative is carried forward for two separate purposes. This is carried forward and used as a comparison both in the NEPA environmental analysis (Chapter 6) and for the CAP Section 14 economic justification (Chapter 7). Under NEPA, the No Action alternative assumes USACE takes no action under the CAP Section 14 authority to stabilize the streambank and the current conditions persist without USACE intervention (FWOP condition), and the NEPA analysis does not contemplate relocation of the JDC. The NEPA analysis assumes continued streambank erosion would eventually lead to damage to the security fence, loss of the outdoor exercise yard and, over time, damage to the JDC buildings. Separately for the economic analysis in Chapter 7, this alternative considers the cost for the NFS to relocate the facility without USACE involvement for the purposes of assessing the potential economic impacts and benefits of implementing shoreline protection measures under CAP Section 14 in the Project area compared to the NFS relocating the facility without USACE involvement.

Alternative 2: Riprap Along Eroded Shoreline

This alternative would stabilize the streambank by constructing a single armored slope at a 2:1 ratio using riprap. The toe of the slope would match the location of the existing

eroded streambank toe. Topsoil would be placed over the riprap and planted with grass and native vegetation. However, planting space would be limited due to the required 15-foot visual clear zone adjacent to the JDC fence. Willow plantings would be incorporated into the face of the repair, similar to those shown in Alternative 3, with willows placed between the riprap at the high tide elevation. LWM would be anchored along the toe of the slope. While the LWM and vegetation plantings would help reduce some of the adverse effects of riprap installation, they would not fully compensate for the loss natural shoreline habitat. Because the single armored slope design does not allow enough space onsite to offset these environmental impacts, this alternative would require habitat enhancement or restoration at an offsite location. To provide in-kind habitat, this alternative would require restoration of shoreline conditions at a separate location through removal of existing riprap.

Alternative 3: Terraced Riprap Berm

This alternative would stabilize the streambank using an armored 2:1 slope with a vegetated terrace. The riprap toe and terrace would extend about nine feet beyond the current streambank toe. The terrace would be built one foot below mean low water, with one foot of topsoil placed on top of the riprap to bring it up to match the mean low water elevation. Marsh vegetation would be planted on the terrace, and willows would be installed between the riprap at the high tide line. Additional native plants would be added above the terrace, outside the 15- foot visual clear zone. LWM would be anchored at the toe of the slope. This design includes onsite plantings to help avoid and minimize environmental impacts and uses the terrace as a habitat feature.

Alternative 4: Laid Back Terraced Riprap Berm

Similar to Alternative 3, this option would place the riprap toe at the base of the existing eroded slope. To maintain the required 15-foot visual clear zone for security, the perimeter fence would be moved about nine feet inland. This change would preserve a clear sightline but reduce the size of the JDC exercise yard. It would also require relocating temporary classroom buildings. Like Alternative 3, this option includes onsite habitat features and willow plantings in the face of the repair. It also reduces impacts to the Chehalis River by avoiding extension of riprap beyond the existing slope base. The terrace would be constructed one foot below mean low water, with one foot of topsoil placed on top of the riprap to bring the surface up to match the mean low water elevation. Marsh (wetland) vegetation would be planted on the terrace, additional native plants would be added above it, outside the 15-foot visual clear zone. Willows would be installed between the riprap at the high tide elevation and LWM would be anchored at the toe of the slope and/or on the terrace. This option includes onsite plantings to avoid and minimize environmental impacts and incorporates the terrace into the design as a habitat feature. This alternative is referred to as a “lay back” because the top of the riprap slope would be set farthest inland compared to Alternative 2 and 3. The upper slope above the terrace would be constructed at a slightly gentler grade than 2:1—ranging from 2.5:1 to 3:1—or as space allows between the top of slope, security fence, and building.

Alternative 5: Soft Shoreline

This alternative takes a more natural approach to erosion control. It involves anchoring geotextile fabric at the toe and head of the stream bank into native soil, then re-grading the shoreline to a 4:1 slope. Wood fiber strands or sand would be placed over the fabric and held in place with a cellular net.

This option would require transporting and placing material to rebuild the eroded shoreline, as well as relocating the security fence and temporary classroom buildings. Like Alternatives 3 and 4, it includes onsite plantings for impact avoidance and minimization for environmental impacts.

Alternative 5 is removed from further consideration because it is unlikely to prevent long-term erosion. The soft shoreline needs a natural feature that can provide a steady supply of material to replace what is lost. However, no such feature exists at the Project site.

Table 4-3: Comparison of Proposed Measures Across Alternatives

Measure	Alt 1: No Action	Alt 2: Riprap Along Eroded Shoreline	Alt 3: Terraced Riprap Berm	Alt 4: Laid Back Terraced Riprap Berm	Alt 5: Soft Shoreline
Relocate the JDC to a different location	X				
Move detention center security fence landward				x	x
Riprap armoring		x	x	x	
Shrub planting		x	x	x	x
Off Site Mitigation		x			
Anchored or loose LWM		x	x	x	x
Terracing			x	x	
Lay back shoreline				x	x
Relocate temporary classrooms				x	x

Shorten discharge pipes		x	x	x	x
Geotextile					x

4.4.2 FINAL ARRAY OF ALTERNATIVES

The following four alternatives were carried forward for evaluation and comparison.

Alternative 1: No Action (Relocate JDC)

As described in Section 4.4.1, this alternative is carried forward for two separate purposes. Under NEPA, the No Action alternative assumes USACE takes no action under the CAP Section 14 authority to stabilize the streambank and the current conditions persist without USACE intervention (FWOP condition). Separately for the economic analysis in Chapter 7, this alternative considers the cost for the NFS to relocate the facility without USACE involvement for the purposes of assessing the potential economic impacts and benefits of implementing shoreline protection measures under CAP Section 14 in the Project area compared to the NFS relocating the facility.

Alternative 2: Riprap Along Eroded Shoreline

This alternative would stabilize the streambank by building a single armored slope using riprap. The toe of the slope would match the location of the existing eroded streambank toe. The design for this alternative is shown in the figure below.

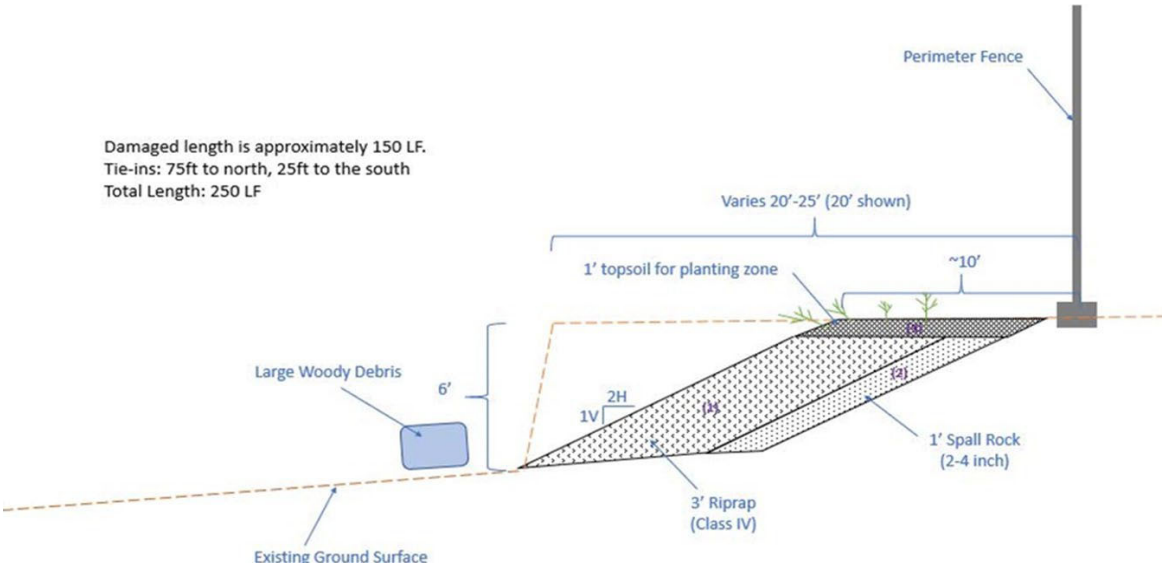

Figure 4-2: Design of Alternative 2

Alternative 3: Terraced Riprap Berm

As previously described in the initial array of alternatives above, this option would stabilize the streambank with an armored slope and includes a planted terraced bench. The design for this option is illustrated in the figure below.

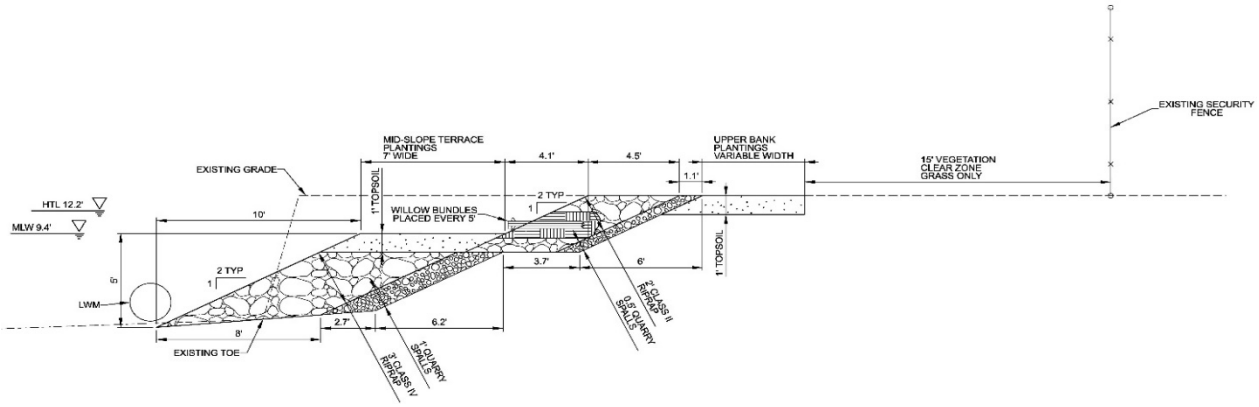

Figure 4-3: Design of Alternative 3 Alternative

Alternative 4: Laid Back Terraced Riprap Berm

Similar to Alternative 3, this design places the riprap toe at the base of the existing eroded slope and moves the perimeter fence inland by approximately 9 feet. The design for this alternative is provided in the figure below.

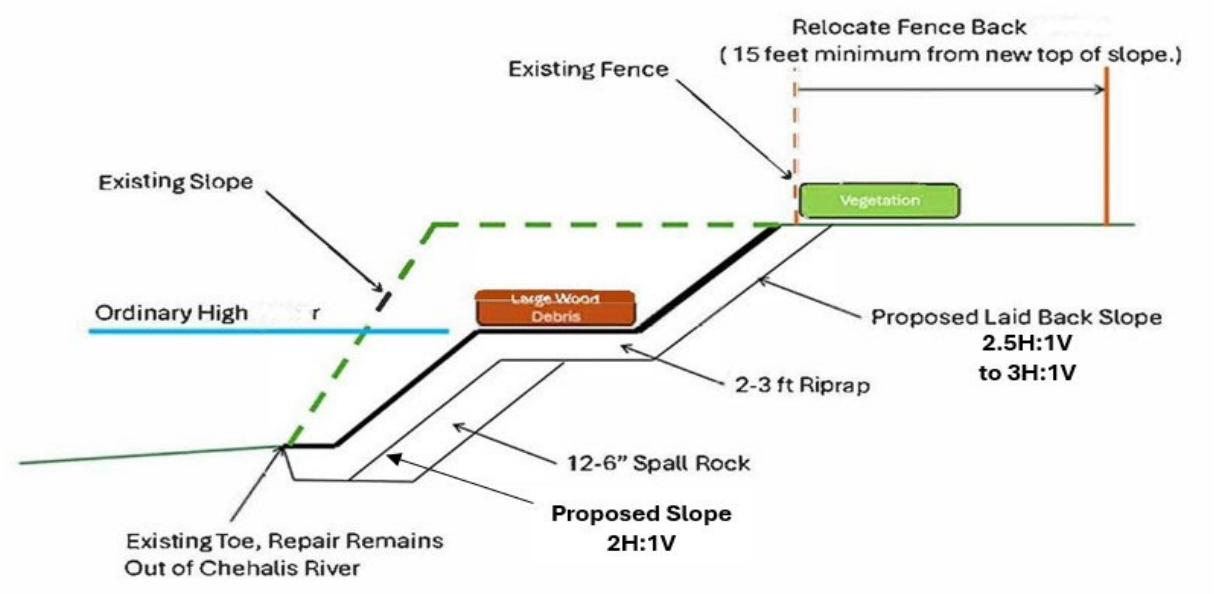

Figure 4-4: Design of Alternative 4

5 PLAN EVALUATION

5.1 OBJECTIVES AND GUIDING PRINCIPLES EVALUATION

In accordance with the 2007 Water Resources Development Act and the planning guidance outlined in ER 1105-2-103, four shoreline management alternatives were evaluated for their consistency with federal objectives and guiding principles. These objectives emphasize maximizing sustainable economic development, avoiding unwise use of floodplains, and protecting and restoring the functions of natural systems. The guiding principles further promote healthy and resilient ecosystems, public safety, sustainable development, wise floodplain use, and a watershed-based approach.

Each alternative was weighed using professional judgement and were given scores of low, medium, and high based on how well each alternative met the objectives and planning guiding principles.

Alternative 1, representing the no-action scenario, ranks low across all evaluation criteria. It does not support economic development, fails to mitigate floodplain risks, and offers no restoration of natural systems. Its performance on safety, ecosystem health, and watershed integration is similarly limited, making it the least aligned with federal planning goals and earning it a low rating in all the objectives and guiding principles.

Alternative 2, which involves riprap placement along the eroded shoreline, shows modest improvement over the baseline. It receives medium ratings for sustainable development by providing a small amount of economic lift. For floodplain management it receives a low rank and it is maintaining the use of a facility in the floodplain. For safety it earned a moderate score by eliminating the danger of the sinkholes. This alternative ranks low on Protecting and restore functions of natural systems, promoting healthy and resilient ecosystems because it involves armoring of the shoreline. It also receives a low in using a watershed approach because it focuses only on a quick armoring to protect the shoreline in this area and does not look at the effect of that on the watershed. For these reasons alternative 2 shows a limited alignment with the full scope of federal objectives.

Alternative 3, featuring a terraced riprap shoreline, demonstrates the strongest alignment with federal planning priorities. It receives low ranks for floodplain management by maintaining the use of a facility in the floodplain. It achieves high ratings in restoration of natural systems, sustainable economic development, public safety, and ecosystem resilience. This alternative reflects a well-integrated approach that balances environmental protection with infrastructure stability and long-term economic value.

Alternative 4, which proposes a laid-back terraced riprap shoreline, ranks high across the economic evaluation criteria due to the work created as well as the protection of the current facility. It also ranks high in protecting the natural function of the ecosystem, promoting a healthier ecosystem, and using a whole watershed approach more than the rest of the alternatives. As with all the other alternatives, this one rank low on the floodplain related objective as they are maintaining the use of a facility constructed within the floodplain. Alternative 4 also has added complexity and a larger footprint which may present trade-offs

in terms of constructability and cost-effectiveness. While it fully supports federal objectives and guiding principles, its incremental advantages over Alternative 3 may not justify the additional investment in all contexts (see Chapter 7).

Based on this comparative evaluation, Alternative 3 offers a robust and balanced solution that aligns closely with national priorities and interagency planning standards. It provides meaningful improvements across economic, environmental, and safety dimensions while maintaining a practical and scalable design. Among the four options, it represents the most favorable combination of performance, feasibility, and consistency with federal investment goals.

Evaluation of each alternative using the Federal objectives and guiding principles is shown below in Table 5-1.

Table 5-1: Evaluation of Alternatives using Federal Objectives and Guiding Principles

Items are Ranked Low Medium High	Objectives			Guiding Principles				
Alternatives	Maximize sustainable economic development	Avoid unwise use of floodplains	Protecting and restore functions of natural systems	Sustainable Economic development	Floodplains	Safety	Healthy and resilient ecosystems	Watershed approach
Alternative 1: (No Action)	Low	Low	Low	Low	Low	Low	Low	Low
Alternative 2: (Riprap Along Eroded Shoreline)	Medium	Low	Low	Medium	Low	Medium	Low	Low
Alternative 3: (Terraced Riprap Berm)	High	Low	Medium	High	Low	High	High	High
Alternative 4: (Laid Back Terraced Riprap Berm)	High	Low	High	High	Low	Low	High	High

5.2 ECONOMIC AND ENVIRONMENTAL P&G EVALUATION

Each alternative was evaluated using the Economic and Environmental P&G for Water and Related Land Resources Implementation Studies of 1983, as amended. These guidelines outline four key criteria for assessing alternative plans: completeness, effectiveness, efficiency, and acceptability. The definitions and rationale for each criterion are summarized below. Table 5-2 presents the evaluation of the alternatives based on these criteria.

Table 5-2: Evaluation of Initial Array of Alternatives with P&G Criteria.

Alternatives	**Complete**	**Effective**	**Efficient**	**Acceptable**	**Rationale**
Alternative 1: (No Action)	Y	N	Y	N	Must move forward for NEPA. This would allow the erosion to continue undermining the fence and eventually the buildings.
Alternative 2: (Riprap Along Eroded Shoreline)	Y	Y	N	Y	This would reduce the speed of the erosion to the riverside and allow the county time to determine a longer-term solution. This alternative would require off site environmental offsets.
Alternative 3: (Terraced Riprap Berm)	Y	Y	Y	Y	This alternative would allow the fence to remain in place but would require placing the riprap toe further into the riverbed. The terracing of this alternative allows for onsite environmental offsets which will lower mitigation costs.
Alternative 4: (Laid Back Terraced Riprap Berm)	Y	Y	N	N	This alternative would require moving both the fence and the temporary classroom.

Completeness refers to the extent to which the alternatives plans provide and account for all necessary investments or other action to ensure the realization of the planned effects. All alternatives assessed in this study are considered complete.

Effectiveness measures how well an alternative addresses the planning objectives, responds to identified problems, and operates within the defined constraints. Alternative 1, the No Action Alternative, does not meet the effectiveness criterion. All other alternatives satisfy this requirement.

Efficiency evaluates whether an alternative provides the most cost-effective means of achieving the planning objectives. Alternative 3 is considered efficient, as it delivers the highest net benefits when compared to Alternatives 2 and 4.

Acceptability is the viability and appropriateness of an alternative from the perspective of the public and its consistency with existing Federal laws, authorities, and public policy. Alternatives 2 and 3 meet the acceptability criterion and are considered appropriate options. Alternative 4 does not meet the acceptability criterion due to the need for temporary relocation of classroom buildings, reduction in exercise yard space, and disruption to existing stormwater drainage systems. Alternative 1 does not meet the acceptability criterion because it is the no action alternative and does not resolve the ongoing erosion issue at the Project site.

6 ENVIRONMENTAL CONSEQUENCES

This chapter describes the existing conditions of resources within the Project area and highlights key factors considered when choosing the preferred alternative, known as the TSP. These existing conditions include the physical, biological, and socioeconomic features of the area.

The decision to select the preferred alternative is based on several considerations, such as how well each option meets the Project's purpose and need, and whether it complies with the Federal standard.

Table 6-1 presents the resources reviewed for detailed analysis and explains why each was either included or excluded. Resources were excluded if they were unlikely to be affected by the proposed alternatives or if they were not relevant to the decision-making process.

Table 6-1: List of Resources Considered for Detailed Effects Analysis and Rationale for Inclusion or Exclusion

Resource	Included in Detailed Analysis (Y/N)	Rationale for inclusion or exclusion
PHYSICAL		
Air Quality and Pollutant Gas Emissions	Y	The proposed action involves construction equipment that would generate exhaust. Analysis is required to determine the extent of potential effects to air quality conditions.
Geology and Soils	Y	The proposed action will excavate and remove soil in the immediate Project footprint. Analysis is required to determine the extent of potential effects to geology and soils.
Groundwater	N	The Project footprint is small and not expected to impact groundwater. Therefore, no analysis is required.
Hydrology and Geomorphology	Y	The proposed Project would add new shoreline armoring to the Chehalis River estuary. Analysis is required to determine the extent of potential effects to hydrology and geomorphology.
Hazardous, Toxic, and Radioactive Waste (HTRW)	Y	There are active and remediated HTRW cleanup sites within 1-mile of the Project site but they do not impact the Project site

Land Use, Utilities, and Infrastructure	Y	The proposed action would prevent further damage to the JDC's stormwater outflow pipes and security fence, allowing those features to persist.
Noise	Y	The proposed action involves construction equipment that would generate airborne and underwater noise. Analysis is required to determine the extent of potential effects of noise.
Transportation and Traffic	Y	The proposed action involves construction equipment that would use surface roads. Analysis is required to determine the extent of potential effects to land-based transportation and traffic.
Water Quality	Y	The proposed action includes work below the high tide line. Analysis is required to determine the extent of potential effects to water quality.
BIOLOGICAL		
Cultural Resources	Y	The proposed action could impact cultural resources. Analysis is required to determine the extent of potential effects to cultural resources.
Fish and Wildlife	Y	The proposed action occurs in areas containing a diversity of fish and wildlife species. Analysis is required to determine the extent of potential effects to fish and wildlife.
Threatened and Endangered Species	Y	The proposed action could affect ESA -listed species in the Project area. Consultation is required with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS). Analysis is required to determine the extent of potential effects to listed species and designated critical habitat.
Vegetation	Y	The proposed action could affect terrestrial and marine vegetation. Analysis is required to determine the extent of potential effects to vegetation.
Wetlands	Y	Wetlands may occur in the Project footprint. Analysis is required to determine the extent of potential effects to wetlands.
SOCIAL AND ECONOMIC		
Public Services, Health, and Safety	Y	The proposed action involves a county operated public service facility. Analysis is required to determine the extent of potential effects to these services.

Recreation and Scenic Value	N	The proposed action does not include recreational facilities, a wild and scenic river, or scenic viewsheds. The river is used for recreation, but the proposed action will not change recreational uses. Therefore, no analysis is required.

6.1 AIR QUALITY AND POLLUTANT GAS EMISSION

The Clean Air Act (42 U.S.C. § 7403) sets National Ambient Air Quality Standards (NAAQS) to control harmful air pollutants. These standards cover six common pollutants: ozone, carbon monoxide, nitrogen dioxide, particulate matter (tiny solid and liquid particles in the air), sulfur dioxide, and lead. Areas that regularly exceed these limits are labeled as nonattainment areas.

The Project site meets NAAQS for all six pollutants. The Environmental Protection Agency (EPA) sets *de minimis* thresholds for emissions in nonattainment and maintenance areas (40 CFR § 93.153). If a nonattainment area improves and consistently meets the standards, it can be redesignated as a “maintenance area.”

According to the Washington State Department of Ecology (Ecology)(Ecology 2025a), all parts of Washington—except for a small of Whatcom County—currently meet air quality standards. Therefore, the Project area is within an attainment area.

Greenhouse gas (GHG) emissions are usually reported in carbon dioxide equivalent (CO_2e), which allows different gases to be compared using a common unit. For Federal projects, the main concern is whether the amount of emissions is large enough to outweigh the benefits of the proposed action. The most recent data (2019) shows that Washington State emitted about 102.1 million metric tons (MMT) of CO_2e annually (Ecology 2022b).

Alternative 1: No Action

Air quality and pollutant gas emissions would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

Impacts to air quality and pollutant gas emissions under Alternative 2 would be similar to those anticipated under Alternative 3 (see analysis below). However, total emission estimates would be higher due to additional construction emissions from a second construction site where an equivalent area of shoreline would be restored to natural conditions by removing existing armoring and reestablishing riparian habitat. USACE estimates that this activity would generate pollutant gas emissions comparable to those projected for Alternative 3. As a result, Alternative 2 would produce approximately double the emissions of Alternative 3, reflecting construction at two separate locations.

Alternative 3: Terraced Riprap Berm

Under the Preferred Alternative, also known as the TSP, construction equipment would generate pollutant gas emissions contributing to air pollution. Emissions were conservatively estimated to reflect the maximum potential impacts associated with implementing the proposed action. To ensure a conservative analysis, calculations were based on equipment manufactured in 2007—prior to improvements in fuel efficiency and emissions standards.

The analysis assumed the use of two excavators and three dump trucks, each operating for approximately 120 hours. These assumptions provide a high-end estimate of emissions, ensuring that the analysis captures the full potential impact. The results of this conservative assessment are summarized in Table 6-2.

Table 6-2: Estimated GHG Emissions for the Preferred Alternative/TSP

Air Pollutant of Concern	Estimated Annual Emissions (metric tons)
Nitrogen Oxide (NOX)	0.25
Reactive Organic Gasses (ROGs)	0.1
Carbon Monoxide (CO)	0.10
Particulate Matter (PM10)	0.02
Sulfur Dioxide (SO2)	0.00
Carbon Dioxide (CO2)	188.20

The closest facility with annual emissions exceeding 10,000 metric tons of carbon dioxide equivalent (CO2e) is a petroleum systems facility in Hoquiam, which reports emissions of approximately 19,751 metric tons of CO2e. In contrast, the estimated emissions from the proposed action under the TSP are 188.57 metric tons of CO2e. This represents a minor contribution when compared to total emissions generated by the United States or the state of Washington.

The limited scale of emissions associated with the TSP would not result in measurable changes to regional or national air quality or GHG levels. While the estimated 188.57 metric tons of CO_2e are not discounted, the contribution is considered minor and confined to the construction phase of the Project.

Additionally, the use of ultra-low sulfur diesel fuel is mandated by the EPA and is the standard fuel available in Washington State (40 CFR §§ 1090.300 and 1090.305; Philip Gent, Environmental Engineer, Air Quality Program, Ecology, pers. comm. 2024). As such, all construction equipment would operate using ultra-low sulfur fuel. Given improvements in engine efficiency and emissions controls, actual emissions during

construction are expected to be lower than the conservative estimates presented in Table 6-2.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts to air quality and GHG emissions under Alternative 4 would be similar to those anticipated under Alternative 3.

6.2 GEOLOGY AND SOILS

Existing soils in the Project area consist primarily of silty clay with trace sand, or clayey silt with trace sand, based on visual observations made during the site visit. A soil hand auger sample was collected in July 2025 and will be analyzed during the D&I phase to help refine the final design—specifically the riprap size, thickness, and underlayment material. However, significant changes to the basic design are not anticipated.

The upper six feet of the soil profile was visually examined along the face of the eroding shoreline. A review of the NRCS Web Soil Survey indicates that native soils in the erosion zone typically consist of silty clay loam, silty clay, or clay. In contrast, soils on the developed land where the JDC is located are likely composed of sandy and loamy river dredge spoils.

Alternative 1: No Action

Geology and soils would not be directly affected under the No Action Alternative, as the Project would not be implemented. Existing site conditions would remain unchanged, and soil erosion would continue over time due to ongoing exposure to tidal currents, fluctuating river flows, and other erosive forces.

Alternative 2: Riprap Along Eroded Shoreline

This alternative involves the least amount of excavation within upland soils. It would have a long-term positive effect by stabilizing the streambank and preventing further soil erosion. Over the life of the Project, this would eliminate additional soil loss and help protect both the upland area and the JDC facilities.

Alternative 3: Terraced Riprap Berm

This alternative involves slightly more excavation of upland soils than Alternative 2. Like Alternative 2, it would have a long-term positive effect by stabilizing the streambank and preventing further soil erosion. Over the life of the Project, this would eliminate additional soil loss and help protect both the upland area and the JDC facilities.

Alternative 4: Laid Back Terraced Riprap Berm

This alternative involves more excavation of upland soils than Alternatives 2 and 3 and would result in a reduction of space within the exercise yard. The security fence and at

least one temporary classroom building would need to be relocated, which would negatively affect the functionality of the JDC by reducing the upland area between the facility and the river. Despite these impacts, the alternative would have a long-term positive effect on soils by stabilizing the streambank and preventing further erosion. Over the life of the Project, this would eliminate additional soil loss and help protect the remaining uplands and JDC facilities.

6.3 HYDROLOGY AND GEOMORPHOLOGY

The Project site is tidally influenced and located along the Chehalis River near its confluence with Elliott Slough. During tidal inflows, turbulence and eddies may form in front of the site as saltwater currents push inland against the outflows from the Chehalis River and Elliott Slough. Under certain conditions, salinity levels at the site can exceed 10 parts per thousand (ppt) (Beverage and Swecker 1969). Overall, the site is shaped by fluvial flows from the Chehalis River basin, diurnal tides with a range of approximately 9.8 feet, and tidal prisms—the volume of water exiting the estuary during ebb tide.

Alternative 1: No Action

Hydrology and geomorphology would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

Alternative 2 would have localized effects on river currents in the immediate vicinity of the riprap installation. The riprap would absorb and deflect wave energy back into the river, helping to reduce erosive forces along the streambank. LWM placed at the toe of the slope would further absorb and dampen deflected wave energy. Willows planted within the face of the riprap at the mean high tide line would also help absorb wave energy and slow water velocity during periods of high river outflow.

Together, these features would stabilize the eroding bank by reducing wave attack and current-driven erosion. However, the broader hydrodynamic forces—including downstream river flow, upstream tidal influence, and natural turbulence at the confluence of the Chehalis River and Elliott Slough—would remain the dominant physical processes shaping the bed and banks of the river beyond the Project footprint.

Alternative 3: Terraced Riprap Berm

Alternative 3 would have localized effects on river currents in the immediate vicinity of the riprap installation. The riprap would absorb and deflect wave energy back into the river, helping to reduce erosive forces along the streambank. Similar to Alternative 2, LWM placed at the toe of the slope would absorb and dampen deflected wave energy. Willows planted within the face of the riprap at the mean high tide line would also help absorb wave energy and slow water velocity during periods of high river outflow. In addition, the terraced bench with herbaceous vegetation would further reduce flow velocity and induce wave shoaling farther from the riverbank. Together, these features would stabilize the eroding

bank by minimizing wave attack and current-driven erosion. However, the broader hydrodynamic forces—including downstream river flow, upstream tidal influence, and natural turbulence at the confluence of the Chehalis River and Elliott Slough—would remain the dominant physical processes shaping the bed and banks of the river beyond the Project footprint.

Alternative 4: Laid Back Terraced Riprap Berm

Alternative 4 would produce similar localized effects on river currents as Alternative 3, with comparable benefits in reducing wave energy and stabilizing the streambank.

6.4 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)

The Phase I Environmental Site Assessment included in Appendix did not identify any potential risks to the project scope from hazardous or toxic waste sites. No significant findings of uncontrolled releases of HTRW were identified that would affect the design or construction within the proposed project footprint. Although there are known HTRW releases to soil and groundwater near the Project site, no releases are known to impact the shoreline repair.

Alternative 1: No Action Alternative

Under Alternative 1, HTRW would remain unaffected, as the Project would not proceed. In the absence of construction, no ground disturbance or sediment exposure would occur, and existing conditions would persist without intervention.

Alternative 2: Riprap Along Eroded Shoreline

There are no known releases at the Project site itself, and contaminated sites nearby do not overlap with the Project site. This alternative will have no impact to HTRW given the current Project site footprint.

Alternative 3: Terraced Riprap Berm

Impacts to HTRW under Alternative 3 would be comparable to those described for Alternative 2.

Alternative 4: Laid Back Terraced Riprap Berm

Alternative 4 would have similar HTRW-related impacts as Alternatives 2 and 3. Neither the alternative itself nor nearby contaminated sites overlap with the current Project site footprint. Therefore, this alternative is not expected to result in any HTRW impacts.

6.5 LAND USE, UTILITIES, AND INFRASTRUCTURE

Land use at the JDC property is designated as governmental services (Grays Harbor

2025a). The property includes essential utilities for JDC operations, such as gas, water, and sewer. The Project site itself contains only outfall pipes that discharge stormwater from the JDC into the Chehalis River. These outfalls have been undercut by ongoing shoreline erosion. Adjacent infrastructure includes Hagara Street to the north and the Grays Harbor Navigation Channel to the south.

Alternative 1: No Action

Land use, utilities, and infrastructure would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

Alternative 2 would not alter land use or infrastructure at the JDC property. However, the Project would affect the existing stormwater outfall pipes, which have been undercut by shoreline erosion. This impact is considered beneficial, as the proposed stabilization measures would prevent further undercutting and reduce future erosion risks. Additional impacts may occur at the offsite mitigation location, depending on site-specific conditions. These impacts could be more substantial, given that shorelines within the Chehalis River estuary are heavily developed and may present greater constraints for restoration activities.

Alternative 3: Terraced Riprap Berm

Alternative 3 would result in similar impacts to land use, utilities, and infrastructure at the JDC property as those described under Alternative 2. However, unlike Alternative 2, this alternative does not require offsite mitigation. As a result, the overall impact to land use and infrastructure would be less extensive, with all construction activities confined to the immediate Project site.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts to land use, utilities, and infrastructure under Alternative 4 would be similar to those described for Alternative 3. However, this alternative may result in greater impacts to site utilities due to the required relocation of the security fence and at least one temporary classroom building. These changes could affect the functionality of the JDC by reducing the available upland area and requiring adjustments to existing utility connections.

6.6 TRANSPORTATION AND TRAFFIC

The Project site is tidally influenced and located below the head of tide. Three USACE navigation projects are active within Grays Harbor. The Grays Harbor Navigation Channel, a federally authorized project, passes approximately 100 to 200 feet from the Project site. USACE has not conducted maintenance dredging upstream of the Port of Grays Harbor terminals since completing dredging at the Elliott Slough Turning Basin in 2006, due to insufficient vessel traffic in the inner harbor to economically justify operations

and maintenance dredging.

The North and South Jetties, along with the Chehalis Revetment, are located approximately 19 miles southwest of the Project site at the entrance to Grays Harbor. Additionally, one USACE flood risk management project—the Aberdeen Authorized Federal Levee—extends approximately 4.5 miles along the left bank of the lower Chehalis River, including a segment directly across from the Project site.

Alternative 1: No Action

Transportation and traffic would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

This alternative would not affect the federally authorized navigation channel in the Chehalis River and, therefore, would have no impact on river traffic or transportation. During construction, localized increases in traffic are expected due to the movement of heavy equipment and material deliveries. These effects would be minor and temporary, limited to the 8- to 12-week construction period. In addition, similar short-term traffic impacts would occur at the offsite mitigation location associated with this alternative.

Alternative 3: Terraced Riprap Berm

Impacts under this alternative would be similar to those described for Alternative 2, but without the additional effects associated with the offsite mitigation location.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts under this alternative would be similar to those described for Alternative 2, but without the additional effects associated with the offsite mitigation location.

6.7 NOISE

The dominant airborne sounds in the Project area include natural sources (such as waves and wind), commercial activity (primarily timber and related industries), and transportation (including boat, train, and vehicular traffic). Airborne noise is typically measured in weighted decibels (dBA), which reflect how sound is perceived by the human ear. In contrast, underwater noise is measured in standard decibels (dB).

According to the Washington State Department of Transportation's (WSDOT) Construction Noise Impact Assessment (2020), factors such as construction equipment type, background noise levels, traffic noise, ground conditions, and the nature of the sound source (point or line) are used to estimate the distance required for construction-related noise to attenuate to ambient levels.

Given the population density and industrial activity in Grays Harbor, ambient airborne

noise is estimated to be approximately 65 dBA (WSDOT 2020). Ambient underwater sound levels recorded at various West Coast locations range widely depending on vessel traffic and geography. For example, sound levels in large marine bays with heavy commercial boat traffic typically range from 147 to 156 dB, while marine inlets with moderate recreational use generally fall between 132 and 143 dB. Areas with mostly recreational boat traffic tend to have lower ambient sound levels, ranging from 115 to 135 dB. In quieter areas, such as the Strait of Juan de Fuca and coastal regions of British Columbia and Washington, ambient underwater noise averages around 75 dB (Erbe 2002; Erbe et al. 2012). Based on these comparisons, ambient underwater noise in Grays Harbor likely ranges between 75 and 132 dB, depending on location and activity.

Alternative 1: No Action Alternative

Airborne noise would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

Alternative 2 would result in a temporary increase in airborne and underwater noise due to construction activities at both the JDC site and the offsite mitigation location. These effects would vary in intensity over the estimated 16-week construction period. A detailed analysis of construction-related noise is provided in Appendix B.2, and key findings are summarized here.

Using WSDOT's (2020; Appendix B.2) equation for estimating sound attenuation, USACE determined that airborne noise from construction would diminish to background levels at approximately 890 feet from the source. Although construction occurs above ground, it can still generate underwater noise. As depth increases, sound travels farther underwater (Kongsberg Maritime Limited 2015); however, because work will take place during low tide when water is absent or very shallow (less than one foot), underwater noise is expected to attenuate close to the shoreline.

In summary, construction noise may cause minor irritation to nearby wildlife and residents but is not expected to result in injury. Noise levels would remain below thresholds of concern, attenuation would occur near the Project footprint, and wildlife would likely avoid areas of elevated sound. Overall, noise impacts would be temporary and negligible.

Alternative 3: Terraced Riprap Berm

Impacts to noise under Alternative 3 would be similar to those described for Alternative 2. However, because this alternative does not include offsite mitigation, noise effects would be confined to the Project site at the JDC. As with Alternative 2, construction-related noise would be temporary and negligible, with no long-term impacts anticipated.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts to noise under Alternative 4 would be similar to those described for Alternative 3. Construction activities would generate temporary increases in airborne and underwater noise, but these effects would be minor and short-lived. Overall, noise impacts would be negligible and would not result in long-term disruption to the surrounding environment or community.

6.8 WATER QUALITY

The Project is located within the brackish estuary of the Chehalis River. Ecology has classified the river segment adjacent to the Project site as “good”. These waters are also designated for multiple beneficial uses, including domestic, industrial, agricultural, and stock water supply; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetics (Washington Administrative Code 173-201A-612).

Although the Project footprint itself is not listed as impaired, Ecology’s Water Quality Assessment identifies downstream waters—outside the immediate Project area—as Category 5 under Section 303(d) of the CWA, due to pH impairments (Ecology 2025b).

Alternative 1: No Action Alternative

Water quality would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

The proposed construction would result in short-term impacts to local water quality. Vegetation removal along the shoreline—and potentially at an offsite mitigation location—may reduce shading, though the low stature of existing vegetation at the Project site is not expected to influence river temperatures. At a site-specific scale, shoreline armoring with stone may lead to localized increases in water temperature. Modified beaches have been shown to exhibit higher daily mean light intensity, air and substrate temperatures, and lower relative humidity (Rice 2006). Offsite mitigation measures would help offset these effects, though at a different location within the estuary.

Excavation of riverbed sediment along the shoreline will be necessary to construct the armored slope, which may temporarily increase turbidity when tidal waters re-enter the disturbed area. Turbidity will be monitored during in-water work, and if levels exceed Washington State water quality standards, USACE will modify or suspend particulate-generating activities and initiate contingency sampling. Based on similar riverbank projects, exceedances are rare, and turbidity levels typically return to background conditions quickly once work is halted. No impacts to pH are anticipated. Overall, effects to water quality would be temporary and negligible.

Alternative 3: Terraced Riprap Berm

Impacts to water quality under Alternative 3 would be similar to those described for Alternative 2. However, because this alternative does not include offsite mitigation, effects would be limited to the Project site at the JDC. The installation of LWM and native plantings would help offset localized increases in water temperature associated with new shoreline armoring. Overall, water quality impacts would be temporary and negligible.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts to water quality under Alternative 4 would be similar to those described for Alternative 3. Construction activities may result in short-term changes to local water conditions, but these effects would be minor, localized, and temporary. Overall, water quality impacts would be negligible and not expected to result in long-term degradation.

6.9 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act requires federal agencies to consider how federally funded or permitted projects may affect historic properties, and to avoid, reduce, or offset any negative impacts. In line with this requirement, USACE consulted with the Washington State Historic Preservation Office (SHPO) about the proposed Project. SHPO agreed with USACE's finding of "No Historic Properties Affected," as noted in Section 10.19, but requested that an inadvertent discovery plan be prepared. USACE will include this plan in the final construction documents to ensure proper procedures are in place if any unexpected cultural resources are found during construction.

Alternative 1: No Action Alternative

Cultural resources would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

With a determination of No Historic Properties Affected, it is unlikely that archaeological sites or artifacts would be encountered during excavation along the streambank. To ensure appropriate response in the event of an unanticipated discovery, an inadvertent discovery plan will be included in the construction documents. This alternative also involves establishing a habitat mitigation area at a separate location, which would require additional consultation with the SHPO. USACE would follow similar procedures at the mitigation site to avoid impacts to historic properties.

Alternative 3: Terraced Riprap Berm

This alternative would require slightly more excavation than Alternative 2 but would not involve an offsite mitigation area, resulting in less overall excavation than Alternative 1.

With a determination of No Historic Properties Affected, the likelihood of encountering archaeological sites or artifacts during streambank excavation is low. Nonetheless, an inadvertent discovery plan will be included in the construction documents to ensure appropriate procedures are in place should any cultural resources be uncovered during construction.

Alternative 4: Laid Back Terraced Riprap Berm

This alternative would require more onsite excavation than Alternatives 2 and 3 but would not involve an offsite mitigation area. With a determination of No Historic Properties Affected, the likelihood of encountering archaeological sites or artifacts during streambank excavation remains low. Nonetheless, an inadvertent discovery plan will be included in the construction documents to ensure appropriate procedures are in place should any cultural resources be uncovered during construction.

6.10 FISH AND WILDLIFE

6.10.1 FISH

More than 50 non-salmonid fish species inhabit the freshwater and estuarine environments of the Chehalis River Basin (Wydoski and Whitney 2003; Hughes and Herlihy 2012; Sandell et al. 2015). In the colder headwater reaches of the upper Chehalis River, salmonids dominate the fish community. As the river transitions downstream into warmer, slower-moving waters—such as those near the Project site—species such as redside shiner (*Richardsonius balteatus*), dace (*Rhinichthys* spp.), and northern pikeminnow (*Ptychocheilus oregonensis*) become more prevalent (Zimmerman and Winkowski 2021). Non-native species, including largemouth bass (*Micropterus salmoides*), have also been introduced to the system. Largemouth bass are known predators of juvenile salmon and thrive in the warm, off-channel habitats of the lower Chehalis River.

Anadromous fish use the estuary throughout the year, with peak abundance in summer and lower numbers in winter, except for steelhead, which return in greatest numbers in December. Juvenile Chinook salmon typically outmigrate in May and June, while coho salmon outmigration occurs primarily from mid-April through late-May.

In the Grays Harbor estuary, located west of the Project site, fish assemblages are more diverse than in upstream freshwater habitats. Many freshwater species also occur in estuarine zones, including three-spined stickleback (*Gasterosteus aculeatus*), sturgeon (*Acipenser* spp.), bull trout (*Salvelinus confluentus*), three species of sculpin (*Cottus* spp.), Pacific lamprey (*Lampetra tridentata*), river lamprey (*L. ayresi*), and speckled dace (*Rhinichthys osculus*) (Monaco et al. 1990; Sandell et al. 2014, 2015).

6.10.2 WILDLIFE

The Project site is located east of Grays Harbor, an area recognized for its high-value

shorebird habitat, including extensive intertidal mudflats, saltmarshes, and uplands. The most abundant shorebird species in the region are western sandpiper (*Calidris mauri*) and dunlin (*Calidris alpina*), with semi-palmated plover (*Charadrius semipalmatus*), least sandpiper (*Calidris minutilla*), red knot (*Calidris canutus*), and black-bellied plover (*Pluvialis squatarola*) commonly observed during migration. American widgeons (*Anas americana*) are the most prevalent waterfowl species, comprising nearly 60 percent of the spring and fall migratory waterfowl population (USFWS 2016).

Wetlands and riparian corridors within the Chehalis Basin support a range of semi-aquatic mammals, including beavers (*Castor canadensis*), muskrats (*Ondatra zibethicus*), river otters (*Lontra canadensis*), water shrews (*Sorex palustris*), and raccoons (*Procyon lotor*), which rely on aquatic habitats for foraging, breeding, and overwintering. Terrestrial mammals commonly observed in the Grays Harbor National Wildlife Refuge—located approximately 7 miles west of the Project site—include black-tailed deer (*Odocoileus* spp.), mink (*Neovison vison*), and short-tailed weasel (*Mustela erminea*) (USFWS 2016).

Marine mammals such as the endangered southern resident killer whale (SRKW) (*Orcinus orca*) and pinnipeds (seals and sea lions) are known to inhabit Grays Harbor but are unlikely to occur within the action area, which is located approximately 3.5 miles inland. No observations of these species have been reported near the Project site.

The Chehalis Basin supports the highest amphibian species diversity in Washington (Cassidy et al. 1997). Wetlands and off-channel aquatic habitats, including oxbows and floodplain ponds near the action area—such as those in Elliott Slough—provide critical breeding habitat for still-water amphibians.

The Chehalis River estuary also supports a diverse assemblage of invertebrates, which serve as essential food sources for birds, fish, and aquatic and semi-aquatic mammals. Common freshwater invertebrates include stoneflies, caddisflies, midges, mosquitoes, aquatic isopods, and blackfly larvae, along with worms, snails, slugs, ants, beetles, amphipods, and terrestrial isopods. Lowland invertebrate communities are often dominated by shredder-gatherer taxa. Invertebrates found in estuarine and saltmarsh habitats include nematodes, oligochaete and polychaete worms, fly larvae, and crustaceans such as aquatic isopods, amphipods, and copepods (Simenstad et al. 2001; Cordell et al. 1999).

Alternative 1: No Action Alternative

Under the No Action Alternative, the Project would not be implemented, and as a result, fish, wildlife, and benthic invertebrates would remain unaffected.

Alternative 2: Riprap Along Eroded Shoreline

The Project would result in short-term impacts to fish, primarily due to temporary increases in turbidity, noise, vibration, and human activity associated with heavy equipment use during construction. These disturbances may displace fish during

construction. In-channel work below the high tide line will be conducted during low tide conditions and within the recommended in-water work window of June 1 to October 31 (USACE 2017), minimizing potential disruption to aquatic movement. Although construction activities may temporarily hinder fish passage through or near the work area—including the offsite mitigation site—movement is expected to resume during breaks in activity.

The Project would result in short-term impacts to wildlife, primarily due to temporary increases in noise and human activity associated with heavy equipment use during construction. These disturbances may displace wildlife during construction. Although construction activities may temporarily hinder fish passage through or near the work area and movement is expected to resume during breaks in activity.

The Project would result in short-term impacts to invertebrates. Shoreline armoring may temporarily disturb benthic habitats; however, the addition of a separate mitigation site, and inclusion of on-site LWM and native plantings would help offset these effects and provide long-term habitat benefits. Overall, effects to invertebrates would be temporary and negligible.

Alternative 3: Terraced Riprap Berm

Impacts to fish under Alternative 3 would be similar to those described for Alternative 2. However, because this alternative does not include offsite mitigation, effects would be limited to the Project site at the JDC. The installation of LWM and native plantings would help offset localized impacts from shoreline armoring, with the added LWM providing habitat benefits for fish. Overall, effects to fish would be temporary and negligible.

Impacts to wildlife under Alternative 3 would be similar to those described for Alternative 2 but limited to the JDC site due to the absence of offsite mitigation. Construction-related disturbance may temporarily displace wildlife in the immediate area, but no long-term impacts are anticipated. Effects to wildlife would be temporary and negligible.

Impacts to invertebrates under Alternative 3 would be similar to those described for Alternative 2 but confined to the JDC site. Shoreline armoring may temporarily disturb benthic habitats; however, the addition of LWM and native plantings would help offset these effects and provide long-term habitat benefits. Overall, effects to invertebrates would be temporary and negligible.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts to fish under Alternative 4 would be similar to those described for Alternative 2. However, because this alternative does not include offsite mitigation, effects would be limited to the Project site at the JDC. The installation of LWM and native plantings would help offset localized impacts from shoreline armoring, with the added LWM providing habitat benefits for fish. Overall, effects to fish would be temporary and negligible.

Impacts to wildlife under Alternative 4 would be similar to those described for Alternative

2 but limited to the JDC site due to the absence of offsite mitigation. Construction-related disturbance may temporarily displace wildlife in the immediate area, but no long-term impacts are anticipated. Effects to wildlife would be temporary and negligible.

Impacts to invertebrates under Alternative 4 would be similar to those described for Alternative 2 but confined to the JDC site. Shoreline armoring may temporarily disturb benthic habitats; however, the addition of LWM and native plantings would help offset these effects and provide long-term habitat benefits. Overall, effects to invertebrates would be temporary and negligible.

6.11 THREATENED AND ENDANGERED SPECIES

In accordance with Section 7(a)(2) of the ESA, federally funded, constructed, permitted, or licensed projects must evaluate potential impacts to federally listed proposed, threatened, and endangered species. The species identified in Table 6-3 are protected under the ESA and may occur within the Project area. The following sections provide a brief summary of relevant information regarding these species, including current knowledge of their presence and use of the Project and action areas. ESA consultation evaluates how the proposed Project may affect listed species and concludes with a determination of effect. Additional details regarding Project compliance with the ESA are provided in Chapter 8, Section 8.6 and Appendix B.3.

Table 6-3: ESA-Listed Species and Designated Critical Habitat That May Be Present in or Near the Project Area Action Area.

Species (Common Name and Scientific Name)	Federal Listing	Critical Habitat in Action Area	Potential Occurrence* (Likely, Unlikely, or Absent)
Bull Trout (*Salvelinus confluentus*)	Threatened; Critical Habitat designated	Yes	Likely
North American green sturgeon (*Acipenser medirostris*)	Threatened; Critical Habitat designated	Yes	Likely

* Likely means the species could be present in the action area. Unlikely means the species could be present in the action area but due to lack of habitat preference and/or food is not expected to be present. Absent means that the species is not present in the action area.

6.11.1 BULL TROUT

The Coastal-Puget Sound bull trout Distinct Population Segment (DPS) was listed as threatened under the ESA in 1999 (USFWS 1999), and its status was reaffirmed in the 2024 5-Year Status Review (USFWS 2024b, c). This DPS is believed to contain the only anadromous form of bull trout in the coterminous United States. Bull trout prefer cold, clean streams but may also use larger, warmer river systems during cooler seasons. They are

highly sensitive to flow patterns and channel structure, relying on complex cover such as LWM, undercut banks, boulders, and pools for protection and foraging. Unlike Chinook salmon, bull trout are iteroparous and spawn multiple times throughout their lives, requiring two-way passage between spawning and foraging habitats.

Bull trout exhibit both resident and migratory life history strategies (Rieman and McIntyre 1993). Resident individuals complete their life cycle within the tributaries where they spawn and rear. Migratory forms spawn in tributaries and rear as juveniles before migrating to lakes (adfluvial), rivers (fluvial), or saltwater (amphidromous) environments (Downs et al. 2006; Fraley and Shepard 1989; Brenkman and Corbett 2005). Juvenile bull trout from fluvial populations typically spend one to four years in natal streams before migrating to larger water bodies (Goetz et al. 2004; Goetz 2016).

Spawning generally begins in late August, peaks in September and October, and concludes by November, triggered by water temperatures falling below 48°F (Goetz 1989). Emergence from the streambed occurs in late winter to early spring. Anadromous bull trout may migrate into tidally influenced areas in late winter or early spring and return to freshwater in late spring and early summer. Although bull trout do not appear to spawn in the Chehalis River Basin, individuals observed in Grays Harbor and the inland estuary are likely foraging migrants from Olympic Peninsula drainages such as the Hoh, Queets, and Quinault Rivers (Jeanes et al. 2003; Goetz et al. 2004).

Historical accounts suggest that the Chehalis River and Grays Harbor once supported spawning populations of bull trout. Today, only low numbers of foraging individuals from other core areas use these systems (Henning et al. 2007). USACE surveys have documented bull trout in Grays Harbor between early March and mid-June (Jeanes et al. 2003), overlapping with the beginning of the in-water work window for the proposed Project. These individuals are likely part of highly migratory populations originating from Olympic Peninsula watersheds (Goetz et al. 2004; Brenkman et al. 2007).

6.11.2 GREEN STURGEON

NMFS 2006, 2025 identified two Distinct Population Segments (DPSs) of green sturgeon:

- the Northern DPS (nDPS), which originates from coastal watersheds north of and including the Eel River in California (e.g., the Klamath (CA) and Rogue (OR) Rivers), and
- the Southern DPS (sDPS), which originates from watersheds south of the Eel River, with the only known spawning population in the Sacramento River (CA).

These DPSs are distinguished by genetic data and spawning locations, although their distributions outside of natal waters generally overlap. The sDPS was listed as threatened under the ESA in 2006 (NMFS 2006), while the nDPS is currently designated as a species of concern.

Southern DPS green sturgeon spawn in the Sacramento River between April and July

(Adams et al. 2007). Juveniles remain in freshwater for one to four years before migrating to the ocean. Subadult and adult green sturgeon spend much of their lives in coastal marine environments, entering estuaries during summer months when water temperatures are at least 4°F warmer than adjacent coastal waters. These estuarine habitats provide abundant food sources, including small bottom-dwelling organisms such as shellfish. Green sturgeon forage differently depending on habitat, using their mouths to extract food from riverbeds in freshwater and feeding on benthic organisms in estuarine and marine environments. Large aggregations of green sturgeon from both DPSs have been documented in the Columbia River estuary and coastal Washington estuaries (Moyle et al. 1992; Moser and Lindley 2007).

Green sturgeon occupies a wide range of depths—from the surface to 360 feet—but typically prefer depths between 130 and 230 feet (Erickson and Hightower 2007). In estuarine environments, they may be present at shallower depths. Subadult individuals from both DPSs spend extended periods in marine and estuarine waters. In Washington, sDPS green sturgeon have been observed in Willapa Bay, Grays Harbor, and the Columbia River estuary (Moser et al. 2016; Schreier et al. 2016). During summer and early fall (June to mid-October), subadult and adult green sturgeon congregate in these coastal bays and estuaries, including Grays Harbor (Lindley et al. 2011). This seasonal presence overlaps with the in-water work window for the proposed Project (June 1 to October 31), indicating that green sturgeon may be present in the action area during construction.

Alternative 1: No Action Alternative

Under the No Action Alternative, threatened and endangered species would remain unaffected, as the Project would not proceed.

Alternative 2: Riprap Along Eroded Shoreline

Federal agencies conduct ESA consultation on a single proposed action, not on multiple possible alternatives. In this case, the TSP serves as the basis for consultation. Impacts to threatened and endangered species under the Alternative 2 would be similar to those described for TSP but would occur across two distinct sites. Temporary adverse effects may result from construction activities at the JDC site, while beneficial effects are anticipated at the offsite mitigation location due to habitat improvements.

Alternative 3: Terraced Riprap Berm

A detailed analysis of potential impacts to bull trout and green sturgeon is provided in Appendix B.3. Key findings are summarized here. For additional information on ESA compliance, see Chapter 8, Section 8.6.

Bull trout may be present in the action area during June, which partially overlaps with the in-water work window (June 1 to October 31). During this period, individuals could be exposed to temporary disturbances from construction activities, including increased turbidity, noise, and the potential for hazardous material or chemical spills. Similarly,

green sturgeon may be present in the action area during construction and could experience comparable short-term impacts. These effects are expected to be temporary and localized, with best management practices (BMP) in place to minimize risk to listed species.

Alternative 4: Laid Back Terraced Riprap Berm

Federal agencies conduct ESA consultation on a single proposed action rather than on multiple alternatives. For this Project, the TSP serves as the basis for consultation. Impacts to threatened and endangered species under Alternative 4 would be similar to those described for TSP, with temporary construction- related effects occurring at the JDC site. These effects are expected to be minor, localized, and short-term, with mitigation measures in place to minimize risk to listed species.

6.12 WETLANDS

The JDC fronts the Chehalis River just upstream of Elliott Slough and is directly adjacent to freshwater emergent and forested/scrub-shrub wetland habitats (Figure 6-1). A reconnaissance-level field assessment conducted in July 2025 identified small, scattered patches of wetland-adapted plant species within the Project footprint. These patches collectively appear to occupy less than one-tenth ($1/10^{th}$) of an acre. A formal wetland delineation will be completed during the (D&I) phase of the Project and will inform the final features and planning necessary for compliance with the CWA, which may include compensatory mitigation (see Section 8.4).

Alternative 1: No Action Alternative

Wetlands would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

This alternative would result in impacts to less than one-tenth (1/10th) of an acre of wetlands within the Project footprint. The required mitigation for wetland impacts under the CWA would be implemented at an offsite location, consistent with applicable regulatory guidance and Project compliance commitments.

Alternative 3: Terraced Riprap Berm

Less than one-tenth (1/10th) of an acre of wetlands would be affected by this alternative. To address potential impacts, the Project design includes mitigation measures. A terrace will be built into the riprap berm at the tidal elevation of mean low water, which aligns with the ordinary high-water line at this site. This feature will support the growth of wetland-adapted vegetation increasing shoreline complexity and refugia. Topsoil will be added to the terrace and planted with a diverse mix of native plant species to enhance habitat quality and ecological resilience.

Alternative 4: Laid Back Terraced Riprap Berm

This alternative would result in similar impacts and incorporate comparable mitigation features as those described for Alternative 3.

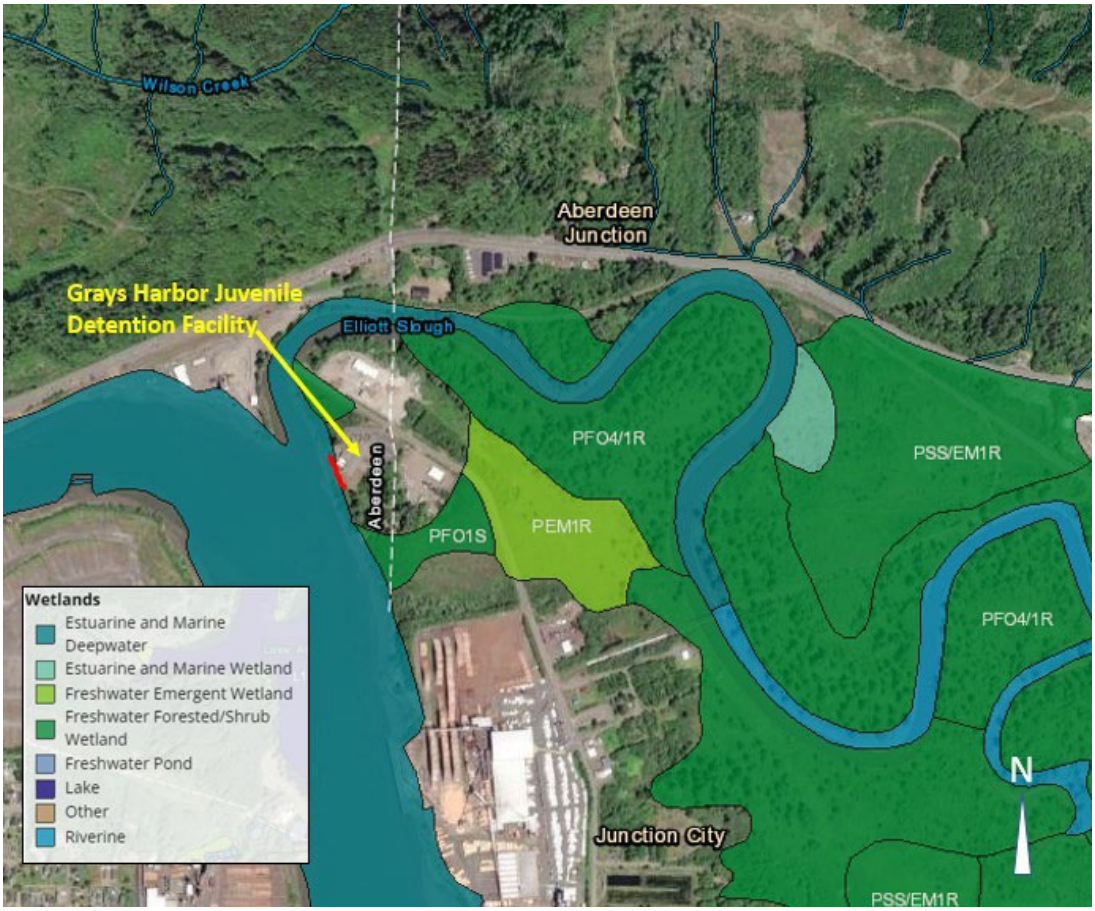

Figure 6-1: National Wetlands Inventory Map (USFWS 2024a): Project Location Shown in Red.

6.13 VEGETATION

Vegetation in the Project area is characteristic of low-lying, tidally influenced riparian zones. Herbaceous species are present along the streambank fronting the JDC, including reed canary grass (*Phalaris arundinacea*), Pacific silverweed (*Potentilla anserina*), seaside arrowgrass (*Triglochin maritima*), and Lyngbye's sedge (*Carex lyngbyei*). Adjacent to this herbaceous zone, the streambank is predominantly vegetated by willows (*Salix sitchensis*, *S. lasiandra*, or *S. hookeriana*) and Pacific crab apple (*Malus fusca*). Outside the construction footprint, mats of sedges are visible on the muddy riverbed. These appear to have originated from higher elevations before collapsing due to bank erosion.

Alternative 1: No Action Alternative

Under the No Action Alternative, vegetation would remain unaffected, as the Project would not proceed.

Alternative 2: Riprap Along Eroded Shoreline

Construction and staging activities under Alternative 2 would temporarily affect both the landscaped lawn surrounding the JDC and areas of natural shoreline vegetation. Approximately 0.26 acres of vegetation would be cleared, including 0.21 acres of landscaped lawn or recently disturbed ground and 0.05 acres of riparian canopy. To reduce these impacts, native vegetation would be planted along a narrow strip at the top of the newly armored shoreline and at an offsite mitigation location, enhancing habitat function and supporting long-term ecological resilience.

Alternative 3: Terraced Riprap Berm

Impacts to vegetation under Alternative 3 would be similar to those described for Alternative 2. However, effects would be limited to the Project site at the JDC, as this alternative does not include offsite mitigation. The Project design incorporates space for native vegetation to be planted along the newly armored shoreline, helping to offset temporary disturbances. Overall, effects to vegetation would be minor, localized, and short-term.

Alternative 4: Laid Back Terraced Riprap Berm

This alternative would result in similar impacts and incorporate comparable mitigation features to those described for Alternative 3.

6.14 PUBLIC SERVICE, HEALTH, AND SAFETY

The JDC is operated by the Grays Harbor County Juvenile Department, which provides community service, court services, detention, diversion, probation, and educational programs for youth referred by law enforcement (Grays Harbor 2025b).

Alternative 1: No Action Alternative

Public service, health, and safety would remain unaffected under the No Action Alternative, as the Project would not be implemented.

Alternative 2: Riprap Along Eroded Shoreline

Alternative 2 would address ongoing streambank erosion along the JDC property, which has already undermined several storm drainage pipes and poses a risk to the security fence enclosing the outdoor yard used by detainees. Construction of the armored shoreline may result in temporary and minor disruptions to facility operations. However, no long-term impacts to public service, health, or safety are anticipated. Additional

impacts may occur at the offsite mitigation location, depending on site conditions. These could be more substantial, as shorelines within the Chehalis River estuary are heavily developed and may present greater logistical and ecological challenges.

Alternative 3: Terraced Riprap Berm

Alternative 3 would result in similar impacts to public service, health, and safety as those described for Alternative 2 at the JDC site. However, because Alternative 3 does not include offsite mitigation, overall impacts would be more limited in scope. Temporary disruptions to facility operations may occur during construction, but no long-term effects to public services or safety are anticipated.

Alternative 4: Laid Back Terraced Riprap Berm

Impacts to public service, health, and safety under Alternative 4 would be similar to those described for Alternative 3. However, this alternative may result in additional temporary disruptions to facility operations due to the need to relocate the security fence and temporary classrooms at the JDC. These adjustments could affect access and use of outdoor and educational spaces during construction, but no long-term impacts to core services are anticipated.

6.15 OPERATIONS, MAINTENANCE, REPAIR, REHABILITATION, & REPLACEMENT (OMRR&R)

All OMRR&R responsibilities are a 100 percent NFS responsibility. For this Project, expected OMRR&R activities across all alternatives will be minimal or nonexistent. The shoreline armoring will continue to prevent erosion, fulfilling the purpose of CAP Section 14, regardless of whether the NFS invests in its operation and maintenance. Therefore, USACE assumes a modest OMRR&R cost of $3,000 per year, distributed evenly across each of the 50 years period of analysis (Table 7-1), for all alternatives except for Alternative 2, which requires off-site mitigation. For Alternative 2, the annual cost is assumed to be $6,000 over the same 50-year period (Table 7-1).

7 PLAN COMPARISON

7.1 ECONOMIC ANALYSIS OF ALTERNATIVES

7.1.1 ALTERNATIVE 1: NO ACTION ALTERNATIVE FOR USACE, NFS RELOCATES FACILITY

If USACE takes no action, the JDC faces a serious risk of damage and flooding due to ongoing shoreline erosion. As water levels rise and flow rates increase, the banks will continue to erode at a faster pace, potentially causing major structural damage and forcing an urgent relocation. Current erosion estimates suggest that the JDC could suffer partial or complete damage within the next six to ten years.

To prevent this risk, the most effective solution would be to relocate the JDC outside the erosion zone. This would involve constructing a new JDC in a safer location, beyond the 100-year floodplain. However, this process would require identifying a suitable site and estimating development costs. USACE expects the total cost of relocation to be significantly higher than the insured replacement cost because additional infrastructure such as roads and utilities may need to be built or expanded. Other expenses, including planning, design, permits, financing, and construction management, would further add to the overall cost.

Even if the County uses its own land with existing infrastructure to build a new JDC, the cost of relocation may still be higher—but close to the insured replacement cost—making it an expensive option. Given these factors, USACE expects the relocation cost to be at least as much as the insured replacement cost. Therefore, if the cost of the least cost action alternative is less than the replacement cost, it is reasonable to assume that it would also be lower than the cost of relocating the JDC. For this reason, USACE uses replacement costs to compare different options and determine the most cost-effective solution. The estimated replacement cost for the Grays Harbor JDC is $7,210,000, based on the Fiscal Year 25 (FY25) price provided by the NFS. This figure serves as the FWOP cost for the economic analysis in this study.

7.1.2 ECONOMIC ANALYSIS

USACE conducted a detailed study on both structural and nonstructural alternative measures, with the findings presented in Chapter 4 of this report. However, the nonstructural approach proved ineffective and was therefore excluded from the Project's screening process. As a result, three action alternatives, along with a no-action alternative, were considered for further evaluation.

The cost estimates for these alternatives were prepared by the cost-engineering team at the Seattle District. The figures listed in Table 7-1 reflect the FY25 price level, based on the assumption that the construction period will not exceed four months.

Table 7-1: Components of the Project Costs for All Alternatives.

Costs Items	Alternatives			
	Economic Alternative 1 (No Action for USACE under CAP Section 14, NFS relocates the facility)	NEPA Alternative 2 (Riprap Along Eroded Shoreline)	NEPA Alternative 3 (Terraced Riprap Berm)	NEPA Alternative 4 (Laid Back Terraced Riprap Berm)
Construction Costs	-	$576,000	$465,000	$644,000
PED Costs	-	$380,000	$374,000	$386,000
Land and Damages	-	$234,000	$0	$0
Const. Mgmt. Costs	-	$152,000	$149,000	$156,000
Project First Costs	-	$1,342,000	$988,000	$1,186,000
Interest During Const. (IDC)**	$0	$0	$0	$0
Replacement Costs	$7,210,000***		-	-
Total Investment	$7,210,000	$1,342,000	$988,000	$1,186,000
OMRR&R Costs	$150,000	$300,000	$150,000	$150,000

Source: Project Total Project Cost Summary (TPCS), 2025.
**The construction period for this Project is less than four months, so USACE has assumed the IDC is $0.
***The insurance estimate of replacement costs for the Grays Harbor JDC.

Table 7-1 compares the costs of four alternatives for the Project. These include Alternative 1 (No Action Alternative), Alternative 2, Alternative 3, and Alternative 4. Each option outlines various cost items and their total amounts.

In CAP Section 14 projects, relocation is not considered an alternative plan. Instead, relocation costs are estimated only for economic justification, not as an actual option (EP 1105-2-58 (29)(d)). These costs help identify the least-cost alternative plan. In such projects, relocation and replacement costs are treated as cost-saving benefits because if a revetment is built to protect the shoreline, it will prevent the need for replacement or relocation of the facility in the future, thereby saving on relocation costs. As a result, the replacement costs (the FWOP costs) are considered cost-saving benefits for the economic analysis. That means the average annual equivalent costs (AAEQ costs) of the FWOP alternative serve as the average annual equivalent benefits (AAEQ benefits).

For economic comparison, the No Action plan does not include details for construction or other costs, but it does include replacement costs totaling $7,210,000 making it the most

expensive option overall for the NFS (the cost would be $0 for USACE because the project would not be pursued under CAP Section 14). Alternative 2 includes $576,000 in construction expenses and $234,000 in real estate (land and damage) costs. With additional costs for planning, management, and contingencies, the total investment (project first costs) comes to $1,342,000. The other alternatives do not include real estate costs. Alternative 3 has construction expenses of $465,000 and includes other related costs, bringing the total to $988,000. Alternative 4 has higher construction costs of $644,000, leading to a total investment of $1,186,000. USACE assumes that annual OMRR&R costs will total $150,000 for all alternatives except Alternative 2, which is expected to cost $300,000 over the first 50 years. These costs are spread evenly across the period and estimated at FY25 price level.

In terms of total costs, the No Action plan is the most expensive for the NFS due to the high replacement costs. Among the planned alternatives under CAP Section 14, Alternative 3 is the most cost- effective, followed by Alternative 4, while Alternative 2 is the costliest.

To calculate the Benefit-Costs Ratio (BCR), the AAEQ benefits are divided by the AAEQ costs for each alternative. Similarly, the AAEQ costs are subtracted from the AAEQ benefits to determine the annual net benefit for each alternative. USACE uses both markers BCR and annual net benefits to select the least-cost alternative. The alternative with the highest BCR value and the highest annual net benefit is the most cost-effective and the least cost choice.

7.1.3 AAEQ COSTS, BCR AND ANNUAL NET BENEFITS:

IWR Planning Suite II was used, and the AAEQ Costs were estimated for an economic analysis using the FY25 federal interest rate of 3.0% and for the 50-year evaluation period. AAEQ Costs for each alternative and the corresponding BCR and Annual Net Benefit dollars are reported in Table 7-2. Under Section 14 of the CAP, USACE policy allows a least-cost action to be justified when its total cost is lower than the cost of replacing or relocating the threatened facility. In this case, if USACE does not take action to address the erosion, the NFS would eventually need to relocate the JDC to continue providing services. As a result, the estimated cost of relocating the facility and yard serves as the benchmark for evaluating and justifying the least-cost alternative.

Since the total AAEQ Costs for No Action alternative represent the total cost-saving benefits, $275,100 is used as the AAEQ Benefits of the Project. These benefits are compared with the AAEQ Costs of each alternative. Finally, the BCR and annual net benefits are calculated to select the most cost-effective option from the three available alternatives.

Table 7-2: AAEQ Costs, BCR and Annual Net Benefit

Costs Items	Alternatives			
	Alt #1: No Action	Alternative #2	Alternative #3	Alternative #4
AAEQ Costs	$272,100	$52,300	$38,400	$46,100
AAEQ OMRR&R Costs	$3,000	$6,000	$3,000	$3,000
Total AAEQ Costs	$275,100	$58,200	$41,400	$49,100
BCR	-	4.72	6.64	5.60
Annual Net Benefits	-	$216,900	$233,700	$226,000
Price Level	October 2024 (FY25)			
Interest Rate	3.0%			
Period of Analysis	50 years			

Source: Calculated by Author, 2025.

Alternative 2 has the highest AAEQ cost at $58,200 and provides the lowest net benefit of $216,900 per year, resulting in a BCR of 4.72. Alternative 4 follows with AAEQ costs of $49,100 and delivers net benefits of $226,000 annually, with a BCR of 5.60. Alternative 3 has the lowest AAEQ cost at $41,400 and offers the highest net benefits of $233,700 per year, resulting in a BCR of 6.64.

In summary, Alternative 3 offers the best value by providing the highest benefits at the lowest cost. Alternatives 2 and 4 are still economically viable, but they are more expensive and deliver lower benefits in comparison.

7.2 COMPREHENSIVE ANALYSIS OF BENEFITS

In accordance with ER 1105-2-103 and the policy directive issued by the Assistant Secretary of the Army for Civil Works (ASA(CW)) on January 5, 2021, benefits to the regional economy—both positive and negative—that are not already included in the NED assessment must be evaluated for each alternative plan. These additional accounts include Regional Economic Development (RED), Environmental Quality (EQ), and Other Social Effects (OSE). Together with the NED analysis, they provide a comprehensive assessment of each plan's overall effects. Table 7-3 ranks the alternatives based on how well they perform in each benefit category. Rankings are based on professional judgment, with 1 being the highest and 4 the lowest.

NED: Alternative 3 ranks first due to its highest average annual equivalent (AAEQ) net benefits.

RED: Grays Harbor County, Thurston County, and Mason County in Washington State collectively define the local impact area used in the regional economic development

(RED) analysis. At both the local and state levels, Alternative 2 consistently generates the highest economic impact. Locally, it supports 17.3 full-time equivalent jobs, $943,977 in labor income, $916,408 in gross regional product, and $2,093,338 in economic output. At the state level, it contributes 18.9 jobs, $ 947,822 in labor income, $ 1,021,290 in gross regional product, and $ 2,660,687 in output—reinforcing its top RED ranking. Alternative 4 follows with 15.3 local jobs, $ 838,164 in labor income, $ 813,686 in gross regional product, and $ 1,858,690 in output; and 16.8 state-level jobs, $ 841,578 in labor income, $ 906,811 in gross regional product, and $ 2,362,444 in output. Alternative 3, with the lowest Civil Works cost, supports only 12.8 local jobs and $ 697,722 in labor income, generating $ 677,345 in gross regional product and $ 1,547,249 in output. At the state level, it contributes 14.0 jobs, $ 700,564 in labor income, $ 754,867 in gross regional product, and $ 1,966,594 in output.

RED rankings are based on regional economic value and job creation. Alternative 2 ranks highest because its higher construction cost generates more jobs and economic activity, followed by Alternatives 4 and 3.

EQ: Alternative 4 ranks highest by offering extensive top-of-slope planting and minimizing disturbance to the riverbank, providing strong protection for natural resource. Alternative 3 ranks second, allowing for diverse vegetation—such as marsh plants and willows—without encroaching on the clear zone, resulting in better environmental quality than Alternative 2. Alternative 2 ranks third due to planting restrictions in the clear zone and the need for off-site mitigation, which reduce its ecological benefits.

OSE: Alternatives 2 and 3 rank highest for their positive impact on streambank stabilization, which helps protect the detention facility and its users. These options also avoid relocating the fence or classrooms. Alternative 4 ranks third because construction would temporarily move a classroom and shift the fence, reducing yard space for detainees. The No Action alternative ranks lowest, as continued erosion could lead to facility failure, negatively affecting students and detainees.

Table 7-3: Comprehensive Analysis of Benefits

Alternatives	NED Rank	RED Rank*	EQ Rank	OSE Rank
Alternative 1: No-Action	4	4	4	4
Alternative 2	3	1	3	1
Alternative 3	1	3	2	1
Alternative 4	2	2	1	3

Source: Authors Estimation, 2025.
*This rank is based on value added in the regional economy and job creation.

8 PLAN SELECTION

In accordance with federal objectives and guidelines, Alternative 3 offers a robust and balanced solution that aligns with national priorities and interagency planning standards. It delivers meaningful improvements across economic, environmental, and safety dimensions while maintaining a practical and scalable design. Among the four action alternatives, it presents the most favorable combination of performance, feasibility, and consistency with federal investment goals.

Under the framework of Economic and Environmental P&G for Water and Related Land Resources Implementation Studies (1983, as amended), Alternative 3 is selected as the preferred plan due to its strong performance across the four evaluation criteria. All alternatives are considered complete, meaning they include the necessary actions to achieve their intended outcomes. However, Alternative 3 stands out by effectively addressing the planning objectives and resolving the identified erosion issue, unlike Alternative 1. It is also the most efficient, offering the highest net benefits compared to Alternatives 2 and 4. Additionally, it meets the acceptability criterion by aligning with public expectations and federal policy without causing major disruptions to existing facilities, making it the most balanced and practicable solution.

Based on economic evaluation criteria, Alternative 3 (Terraced Riprap Berm) is identified as the Preferred Alternative and serves as the TSP. It represents the least-cost option, with total expenses lower than relocating the facility, while providing greater net benefits than the other alternatives. The TSP would stabilize the streambank adjacent to the JDC, reducing the risk of future infrastructure failure and helping preserve critical facility operations. It is the most effective and economically efficient method of streambank stabilization, yielding approximately $233,700 in annual net benefits and a benefit–cost ratio of 6.64.

Through a comprehensive analysis of benefits, Alternative 3 is preferred because it offers the highest net benefits under the NED account, demonstrating strong economic justification and cost-effectiveness. Although it ranks third in RED due to lower job creation and output compared to Alternatives 2 and 4, it still contributes meaningfully to local and state economies with the lowest Civil Works cost. Environmentally, it ranks second by supporting diverse vegetation without encroaching on the clear zone, offering substantial ecological benefits. In terms of OSE, it ties for first by stabilizing the streambank and protecting the detention facility without disrupting classrooms or yard space. This balanced performance across all four accounts, economic efficiency, environmental quality, regional impact, and social outcomes, supports the selection of Alternative 3 as the preferred plan.

In conclusion, following all relevant evaluation criteria, Alternative 3 emerges as the most balanced and cost-effective solution. It meets federal planning standards, addresses key erosion concerns, and delivers strong economic and environmental benefits without compromising social or operational needs. Its selection as the preferred alternative reflects a comprehensive and well-supported decision that advances both national objectives and local priorities.

9 TENTATIVELY SELECTED PLAN (TSP) / AGENCY PREFERRED ALTERNATIVE

9.1 TSP ACCOMPLISHMENTS

Alternative 3 (Terraced Riprap Berm) is the Preferred Alternative and serves as the TSP. It represents the least-cost option, with total expenses lower than relocating the facility, while offering greater net benefits than the other alternatives. The TSP would stabilize the streambank adjacent to the JDC, reducing the risk of future infrastructure failure and helping preserve critical facility operations. It is the most effective and economically efficient method of streambank bank stabilization, yielding approximately $233,700 in annual net benefits and a BCR of 6.64. The design allows the existing security fence to remain in place; however, it requires shifting the toe of the slope into the river, which would result in some environmental impacts. To address these effects, the TSP incorporates features that offset habitat impacts, including native plantings, a constructed terrace with wetland vegetation, and anchored LWM.

9.2 DESCRIPTION OF TSP

The TSP involves a standard shoreline armoring method, featuring a regraded bank stabilized with rock. Feasibility-level design drawings of the TSP are included in Appendix A. Construction is expected to take place during a single season, roughly between May 1 and October 31. All in-channel work below the high tide line will be done during low tide and within the designated in-water work window (June 1 to October 31) to reduce impacts on aquatic resources. Site access will use existing roads and the mowed lawn surrounding the JDC.

Within the construction area, the shoreline will be cleared and reshaped to create a 2H:1V armored slope facing the river, with a mid-slope terrace. The slope will be built using a 4-foot-thick layer of riprap placed over a base of 4- to 8-inch quarry spalls. For security, a 15-foot-wide grass lawn must remain clear next to the JDC's perimeter fence. Outside this zone, native plants will be added along the top of the bank and the mid-slope terrace. Willow bundles will be installed within the armored slope above the terrace, and anchored LWM will be placed at the toe of the slope to improve habitat complexity and ecological function.

Appendix A describes the wind-driven wave, river flow, and tidal conditions contributing to erosion along the JDC shoreline, as well as the recommended riprap sizing to stabilize the bank. Revetment rock sizing was determined by evaluating the combined forces of wind-generated waves striking the shoreline and the dynamic pressures from tidal fluctuations and river flows. Based on this analysis and the size of existing onsite riprap, the TSP—currently at approximately 35-percent design maturity—includes a mix of Class II and Class IV riprap, with Class IV serving as the primary protection at the base of the revetment. These sizes are consistent with previous stabilization efforts by the NFS, who placed 12-inch diameter rock along portions of the eroding bank roughly a decade ago and align with findings from the preliminary design analysis. Final design specifications will be refined during the D&I phase, though substantial changes to the proposed riprap

sizing are not anticipated.

9.3 UNAVOIDABLE ADVERSE IMPACTS

Chapter 4 of this document outlines the planning framework and decision-making process used by USACE to develop and evaluate Project alternatives. The Preferred Alternative, also referred to as the TSP, balances the need to protect the JDC facility with efforts to avoid, minimize, and/or mitigate adverse environmental effects. Appendix B.3 provides detailed analyses of potential impacts to ESA-listed species and designated critical habitat, while Chapter 8, Section 8.6. Summarizes the status of ESA consultation.

Construction of the TSP will result in both short- and long-term effects to the natural environment. In the short term, activities involving heavy equipment may temporarily disturb aquatic habitat and pose risks to individual fish through displacement, injury, or mortality. To reduce these risks, USACE will require the contractor to implement construction best management practices, including working during low tides and adhering to the designated in-water work window. With the implementation of the measures described in Chapter 7, Section 7.5.2, potential adverse effects to individual ESA listed fish are expected to be insignificant or discountable.

In the long term, the Project will alter the physical characteristics of approximately 240 linear feet of shoreline along the Chehalis River through the placement of rock riprap. To minimize habitat changes associated with this armoring, the design incorporates ecological enhancements to the extent practicable. These include a vegetated terrace, willow plantings along the riverbank, anchored LWM at the toe of the slope, and upland vegetation plantings to support habitat function and water quality.

9.4 MITIGATION FOR ADVERSE ENVIRONMENTAL IMPACTS

Using the procedural framework outlined in 40 CFR § 1508.1(s)(1–5), mitigation refers to measures that avoid, minimize, or compensate for effects caused by a proposed action or its alternatives, as described in an environmental document or record of decision. These measures must have a clear nexus to the identified effects. While the NEPA requires consideration of mitigation, it does not mandate the adoption or implementation of specific mitigation actions. Mitigation may include:

- Avoiding the impact altogether by not taking a certain action or parts of an action.
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time through preservation and maintenance operations.
- Compensating for the impact by replacing or providing substitute resources or environments.

The TSP incorporates measures to mitigate potential impacts from new shoreline armoring on water quality, fish and wildlife, and ESA-listed species. These mitigation features are described below. No compensatory mitigation under the CWA is proposed for the TSP.

9.4.1 IN-WATER WORK WINDOW

Construction activities occurring below the high tide line may involve in-water work. To minimize potential impacts to sensitive aquatic species in the Chehalis River, all such activities will be restricted to the designated in-water work window, from June 1 to October 31 (USACE 2017).

9.4.2 BEST MANAGEMENT PRACTICES

Listed below are best management practices (BMPs) and conservation measures that will be implemented as part of the Project to avoid, minimize, and compensate for effects on ESA-listed species and protected habitats. These measures include both avoidance strategies and impact minimization techniques.

Avoidance and Minimization Measures

The following avoidance and minimization measures will be implemented by the contractor during construction:

- Clearly identify and mark construction limits prior to beginning work.
- Conduct all construction activities during daylight hours only.
- Perform construction activities below the high tide line during low tide conditions to avoid and minimize in-water work.
- Limit construction below the high tide line to the approved in-water work window (June 1 to October 31).
- Do not operate vehicle drive trains in-water.
- Do not end-dump rock armor onto the shoreline slope or into the water.
- Individually place rock armor to form a cohesive face with minimal gaps.
- Use biodegradable hydraulic fluids in construction equipment.
- Park equipment in designated areas away from the shoreline and stormwater drains at the end of each shift.
- Comply with state water quality standards as outlined in the Project's Section 401 Water Quality Certification.
- Prepare and implement a Stormwater Pollution Prevention Plan.
- Prepare and implement a Spill Prevention and Control Plan.
- Clean construction materials and equipment of contaminants (e.g., oils, excessive sediment) before bringing them to the site, in a location where pollutants can be

contained.

- Remove and properly dispose of trash and unauthorized fill within the Project footprint, including old fencing, concrete blocks, bricks, asphalt, metal, treated wood, glass, floating debris, and paper.
- Limit disturbance to only those areas necessary for construction and restore affected areas to their original or improved condition upon completion (e.g., remove gravel used to traverse grassed areas, repair and replant disturbed landscaping, hydroseed bare areas).
- Retain cleared native vegetation and woody material (e.g., tree trunks, root wads, large shrubs) on site and place them along the mid-slope and toe of the armored slope. Materials that cannot be reused will be disposed of off-site. Noxious weeds will be disposed of separately from other organic materials at an approved off-site location.
- Conduct excavation and ground-disturbing activities during dry conditions to minimize environmental impacts and ensure that all excavated soils are properly characterized before being transported for off-site disposal.

Offset and Minimization Measures

The following offset and minimization measures are incorporated into the Project design:

- The design integrates natural features to reduce and offset environmental impacts associated with shoreline armoring, including the vegetated terrace. These measures will be further refined during the D&I phase.
    - Native vegetation plantings will be included (see Table 9-1) to help minimize the loss of food resources and minimize potential declines in water quality associated with new shoreline armoring. The terrace will be planted with native marsh vegetation. Willows will be placed along the upper slope of the revetment, among the riprap. The top of the slope will be planted with grasses, low-growing shrubs, and trees, while preserving a 15-foot visual clear zone along the security fence.
    - LWM will be placed and anchored along the toe of the armored slope to minimize and offset impacts to fish refuge and foraging habitat.

Table 9-1: Recommended Plant Species by Elevation and Location for Environmental Mitigation Planting

Location	General Elevation	Plant Species
Upper Bank	At the high tide line	Willows (*Salix sitchensis, S. lasiandra, or S. hookeriana*), Pacific crab apple (*Malus fusca*), black twinberry (*Lonicera involucrate*), native grasses

Mid-slope Terrace	At mean high water	Pacific silverweed (*Potentilla anserina*), Baltic rush (*Juncus balticus*), lyngbye sedge (*Carex lyngbyei*), seaside arrowgrass (*Triglochin maritima*), salt grass (*Distichlis spicata*)
Willow bundles	Above the mid-slope terrace	Willow (*Salix sitchensis, S. lasiandra, or S. hookeriana*).

9.5 COST ESTIMATE

The cost estimates for the TSP were prepared by the Seattle District's cost engineering team using FY25 price levels (see Appendix C: Project TPCS for Alternative 3). These estimates assume that construction will take less than four months.

As shown in Table 9-2, the total project first cost is $988,000. This includes $465,000 for construction, $374,000 for planning, engineering, and design (PED), and $149,000 for construction management. No costs are anticipated for land acquisition or damages. The fully funded total cost of the Project is $1,088,000 (see Appendix C: Project TPCS for Alternative 3). This amount includes the project first costs, along with adjustments for inflation and anticipated cost increases by the midpoint of construction. Since the construction period is short, interest during construction (IDC) is assumed to be zero. Replacement costs do not apply to this plan. In addition, annual costs for OMRR&R are estimated at $3,000 per year estimated at FY25 price level, totaling $150,000 over a 50-year period.

Table 9-2: Item Wise Project First Costs for Recommended Plan

Cost Items	**Costs ($)**
Construction Costs	$465,000
PED Costs	$374,000
Land and Damages	$0
Construction Management Costs	$149,000
Project First Costs	$988,000
Interest During Const. (IDC)**	$0
Replacement Costs	-
Total Investment	$988.000
OMRR&R Costs	$150,000

Source: Project TPCS, 2025
**The construction period for this Project is less than four months, so USACE has assumed the IDC is $0.

9.6 COST SHARE

Under Section 14 of the Flood Control Act of 1946, as amended, Emergency Streambank and Shoreline Protection projects follow a structured cost-sharing approach. During the feasibility phase, the first $100,000 of study costs is fully funded by the federal government—no non-federal contribution is required. Any study costs beyond that amount are split equally between USACE and the NFS. For the phase that follows feasibility, total project costs are shared at a rate of 65 percent federal and 35 percent non-federal, except for land and damages, which are entirely the responsibility of the NFS. Additionally, all costs for OMRR&R are non-federal responsibilities (see Table 9-3).

While the project first cost is used for most analytical purposes, cost-sharing decisions are based on the total project cost—that is, the fully funded costs. The Table 9-3 below summarizes the cost share for the TSP, breaking down fully funded total project costs into major categories and showing how each is divided between USACE and the NFS. The total project cost is $1,088,000, of which $707,200 is the federal share and $380,800 is the non-federal share. By Project component, construction costs total $512,000, with $332,800 covered by the federal government and $179,200 by the NFS. Design costs amount to $407,000, split into $264,550 federal and $142,450 non-federal shares. Land and damages are not eligible for federal cost sharing and are fully borne by the NFS; in this case, the cost is $0. Construction management costs total $169,000, with $109,850 provided federally and $59,150 by the NFS. OMRR&R costs are excluded from federal participation and are the full responsibility of the NFS.

Table 9-3: Cost Share of the Recommended Plan

Cost Items	Total Project Costs: Fully Funded ($)	Federal Share	Non-Federal Share
Construction Costs	$512,000	$332,800 (65%)	$179,200 (35%)
PED Costs	$407,000	$264,550 (65%)	$142,450 (35%)
Land and Damages	$0	$0 (0%)	$0 (100%)
Const. Mgmt. Costs	$169,000	$109,850 (65%)	$59,150 (35%)
Total Project Costs	$1,088,000	$707,200 (65%)	$380,800 (35%)

Source: TPCS, 2025 and EP 1105-2-58, March 2019 (pp. 33-34).

9.7 LANDS, EASEMENTS, RIGHTS-OF-WAY, RELOCATIONS, AND DISPOSAL

Real estate required for this Project includes approximately 0.34 acres of Bank Protection Easement and approximately 0.06 acres of Temporary Work Area Easement. The 0.34 acres of Bank Protection Easement are needed for permanent Project features and are located on land already owned in fee by the NFS. USACE is also coordinating with the Washington Department of Natural Resources (WDNR) because the project includes

work in the river below the mean high tide line. WDNR asserts jurisdiction over these aquatic lands within the project area. Rather than requiring the NFS to seek easements from WDNR, USACE will be exercising the reserved rights of the United States under the doctrine of Navigational Servitude[1] for this project in 0.15 acres of aquatic lands.

Per the terms set forth in the CAP, Section 14 of the Flood Control Act of 1946 (PL 79--526), as amended, the NFS will not be afforded LERRD crediting for its existing Project lands, as these lands and associated facilities will directly benefit from Project implementation. The NFS shall be credited for eligible Real Estate Administrative costs.

9.8 OPERATIONS, MAINTENANCE, REPAIR, REPLACEMENT AND REHABILITATION

All OMRR&R responsibilities for this Project are the sole responsibility of the NFS. For the TSP, expected OMRR&R activities are minimal because the armored shoreline is designed to prevent erosion even without future investment in operation and maintenance by the NFS. Therefore, USACE assumes a nominal annual OMRR&R cost of approximately $3,000 in FY25 price level.

9.9 VIEWS OF THE NFS

The NFS, Grays Harbor County, has expressed strong support for the Project and remains actively engaged in its development and implementation.

[1] It is well settled that the United States has the dominant right to control and regulate navigable waters of the United States in the interest of commerce, and that it may use lands beneath navigable waters for this purpose without payment of compensation to the owner. The right of the United States to use navigable waters for purposes of navigation and flood control is considered an appropriate exercise of the commerce clause under the U.S. Constitution.

10 ENVIRONMENTAL COMPLIANCE

This Environmental Assessment (EA) is being prepared pursuant to Section 102(C) of the NEPA and includes consideration of compliance with applicable laws, regulations, and Executive Orders, as outlined in the sections below.

10.1 AMERICAN INDIAN RELIGIOUS FREEDOM ACT

The American Indian Religious Freedom Act (42 U.S.C. § 1996) affirms the protection and preservation of Native Americans' rights to freedom of belief, expression, and the exercise of traditional religions. Judicial interpretations of the American Indian Religious Freedom Act require public officials to consider Native American interests prior to undertaking actions that may affect religious practices, including impacts to sacred sites. The TSP is not expected to affect these rights, and there are no known cultural resources or sacred sites within the Project area.

10.2 BALD AND GOLDEN EAGLE PROTECTION ACT

The Bald and Golden Eagle Protection Act (16 U.S.C. § 668–668d) prohibits the taking, possession, or commercial use of bald and golden eagles, except under specific permitted circumstances. According to 2025 Naturalist observations, no bald eagles or nests have been documented near the Project area. The closest potential nest is located approximately one mile northeast of the Project site, based on recorded eagle sightings. As no known nests occur within or adjacent to the project footprint, the proposed project is not expected to result in take of either bald or golden eagles.

10.3 CLEAN AIR ACT

The Clean Air Act, as amended (42 U.S.C. § 7401 et seq.), prohibits federal agencies from approving any action that does not conform to an approved state or federal implementation plan. Construction activities associated with the proposed Project, including the operation of vehicles and equipment, would result in temporary increases in emissions and fugitive dust. The Project area is located within an attainment area (EPA 2024a). Based on the anticipated level of emissions, USACE has determined that the Project's air quality impacts are clearly *de minimis* and, therefore, a conformity determination is not required pursuant to 40 C.F.R. § 93.153(c)(2)(iv).

10.4 CLEAN WATER ACT (FEDERAL WATER POLLUTION CONTROL ACT)

The Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), commonly known as the CWA, is the primary legislative framework for federal water pollution control programs and the regulation of pollutant discharges into waters of the United States. The CWA was enacted to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." It establishes goals to eliminate pollutant discharges into navigable waters, protect fish and wildlife, and prohibit the release of toxic substances in quantities that could harm the environment.

This Environmental Assessment (EA) evaluates potential impacts to water quality, with particular attention to suspended solids, turbidity, and temperature. Three sections of the CWA are relevant to the proposed action: Sections 401, 402, and 404. The requirements associated with each of these sections are briefly described below.

10.4.1 SECTION 401

Under Section 401 of the CWA, a federal agency may not issue a permit or license for any activity that could result in a discharge into waters of the United States unless a Section 401 water quality certification is issued or waived. States and authorized tribes where the discharge would originate are generally responsible for issuing these certifications. In cases where a state or tribe lacks authority, the U.S. EPA assumes responsibility (33 U.S.C. § 1341). For the proposed Project footprint, Ecology is the delegated authority.

USACE policy requires that, during the feasibility phase, any Project recommended for construction authorization must demonstrate reasonable assurance that all applicable environmental compliance requirements have been or can be met. USACE intends to submit draft documentation to Ecology as part of the pre-application process for requesting Section 401 water quality certification. Final certification is anticipated during the D&I phase.

10.4.2 SECTION 402

Section 402 of the CWA addresses non-point source discharges, including—but not limited to—stormwater runoff from construction sites. Analysis under Section 402 may be required when a construction site involves more than one acre of ground disturbance (EPA 2024b). The proposed Project will disturb less than one acre of ground; therefore, a National Pollutant Discharge Elimination System (NPDES) construction site stormwater runoff permit is not required at this time. If this determination changes during the D&I phase, a NPDES permit will be obtained prior to construction.

10.4.3 SECTION 404

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands, and generally requires a permit from USACE. While USACE administers Section 404, it does not issue permits to itself for its own civil works activities. Instead, USACE assumes responsibility for ensuring compliance with Section 404 requirements for jurisdictional activities associated with its projects. For the proposed action, USACE is evaluating potential project-induced effects based on the feasibility-level design and will prepare a draft Section 404(b)(1) evaluation for inclusion in the final IFR/EA. Completion of the final 404(b)(1) evaluation is anticipated during the D&I phase. No compensatory mitigation is currently proposed for any of the alternatives, as coordination under the CWA is still ongoing. However, the cost estimates for each alternative include contingency funds for compensatory mitigation under the fish and wildlife facilities (Appendix C). If compensatory mitigation is ultimately required, it will be incorporated into the final Project.

10.5 COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act (CZMA), as amended (16 U.S.C. §§ 1451– 1464), requires federal agencies to conduct activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved State Coastal Zone Management Program. During the D&I phase, when site-specific construction drawings and contract documents are prepared, USACE will submit a federal consistency determination along with all necessary documentation to Ecology as part of the request for a Water Quality Certificate (WQC). CZMA concurrence from Ecology will be obtained prior to award of the construction contract.

10.6 ENDANGERED SPECIES ACT

In accordance with Section 7(a)(2) of the ESA, as amended, federally funded, constructed, permitted, or licensed projects must consider potential impacts to federally listed or proposed threatened and endangered species and their designated critical habitats. USACE evaluated potential effects to ESA-listed bull trout and green sturgeon, as well as associated critical habitat, and made the effect determinations summarized in Table 10-1. A Biological Assessment (BA) was submitted to the USFWS and the NMFS on August 19, 2025. Formal consultation is ongoing. Table 10-1. Summary of effects determinations for ESA-listed species and designated critical habitat.

Table 10-1: ESA-Listed Species: Effects to Species and Critical Habitat Determination

Species	Effect to Species Determination	Effect to Critical Habitat Determination
Bull Trout	May affect, not likely to adversely affect	May affect, likely to adversely affect
Green sturgeon	May affect, not likely to adversely affect	May affect, likely to adversely affect

10.7 FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act (FWCA), as amended (16 U.S.C. §§ 661– 667e), authorizes the USFWS to evaluate the effects of proposed water resource development projects on fish and wildlife resources. The FWCA requires that these resources receive equal consideration alongside other project features. Federal agencies undertaking construction, licensing, or permitting of water resource projects must consult with the USFWS, the NMFS, and relevant state resource agencies to assess potential impacts and identify appropriate mitigation measures. Section 2(b) of the FWCA directs the USFWS to prepare a Coordination Act Report that describes fish and wildlife resources in the project area, evaluates potential adverse effects, and provides recommendations.

On August 22, 2025, USACE contacted the USFWS to initiate coordination on the proposed Project in accordance with the FWCA. On the same day, USFWS responded that no staff member in the Washington office is specifically assigned to FWCA coordination, but the individual handling the ESA consultation would likely address it. As of this writing, USFWS has not assigned a consulting biologist for the Project.

10.7.1 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act, (16 U.S.C. § 1801 *et. seq.*), as amended by the Sustainable Fisheries (PL 104-267) requires Federal agencies to consult with the NMFS regarding actions that may adversely affect Essential Fish Habitat (EFH) for Pacific coast groundfish, coastal pelagic species, and Pacific salmon. The Magnuson-Stevens Fishery Conservation and Management Act defined EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH is the habitat (waters and substrate) required to support a sustainable fishery and a managed species’ contribution to a healthy ecosystem. Waters include aquatic areas, and their associated physical, chemical, and biological properties used by fish. Substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities.

The action area contains areas that have been designated EFH. According to a location query in the NMFS EFH Mapper, the action area is designated as EFH for groundfish and Chinook and coho salmon (NMFS 2025). In addition, the action area overlaps with estuaries, which are identified as a habitat area of particular concern (NMFS 2025). The project may affect EFH and outlined this determination is the BA sent to NMFS on August 19, 2025. Consultation is ongoing.

10.8 MARINE MAMMAL PROTECTION ACT (MMPA)

The MMPA (16 U.S.C. §1361-1407) restricts harassment of marine mammals and requires interagency consultation in conjunction with the ESA consultation for Federal activities. All marine mammals are protected under the MMPA regardless of whether they are endangered, threatened, or depleted.

The most common marine mammal species observed in the Grays Harbor includes humpback whale, gray whale, harbor seal, California sea lion, and harbor porpoise. These species are not expected to occur at the project site. Furthermore, the primary concern for marine mammals is underwater noise from construction. The effects to marine mammals of rock placement along JDC are not expected to rise to the level of take (Appendix B.2; 78 FR 30875, 78 FR 4541). USACE has compared the estimated noise from rock placement and the guidance on assessing impacts and concluded that there is no requirement for an Incidental Harassment Authorization.

10.9 MIGRATORY BIRD TREATY ACTAND EXECUTIVE ORDER

13186, RESPONSIBILITIES OF FEDERAL AGENCIES TO PROTECT MIGRATORY BIRDS

The Migratory Bird Treaty Act, (16 U.S.C. § 703-712) as amended protects over 800 bird species and their habitat and commits that the U.S. will take measures to protect identified ecosystems of special importance to migratory birds against pollution, detrimental alterations, and other environmental degradations. EO 13186 directs Federal agencies to evaluate the effects of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative effects to migratory birds. Implementation of the project would not cause direct and deliberate depredation, injury or harm or result in the degradation of habitat for migratory birds. Birds are assumed to be habituated to the noise and activity in the area. Therefore, a permit application for “take” of migratory birds is not required.

10.10 NATIONAL ENVIRONMENTAL POLICY ACT

NEPA (42 U.S.C. § 4321 et seq.) commits Federal agencies to considering, documenting, and publicly disclosing the environmental effects of their actions. It requires that an Environmental Impact Statement (EIS) be included when a recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. Major Federal actions determined not likely to have significant adverse effects on the quality of the human environment may be evaluated through an EA. This draft IFR/EA evaluates the environmental effects requiring NEPA compliance with the proposed Project.

10.10.1 NEPA SUMMARY

USACE is releasing this draft IFR/EA and draft FONSI (Appendix B.1) for the proposed Project for a 30-day public review and comment period. Public comments are invited on this draft IFR/EA and draft FONSI and will be considered prior to their finalization. Comments and responses will be included in the final IFR/EA.

This draft IFR/EA and draft FONSI is made available for public review and comment. USACE invites submission of comments on the environmental impact of the proposed action. USACE will consider all submissions received during the comment period. The nature or scope of the proposal may be changed upon consideration of the comments received and this IFR/EA updated. If significant effects on the quality of the human environment are identified and cannot be mitigated for, USACE would initiate an EIS and afford all the appropriate public participation opportunities attendant to an EIS.

10.11 NATIONAL HISTORIC PRESERVATION ACT

Section 106 (54 U.S.C. § 306108) of the National Historic Preservation Act (NHPA)(54 U.S.C. § 300101) requires that Federal agencies evaluate the effects of Federal undertakings on historical, archeological, and cultural resources and afford the Advisory Council on Historic Preservation opportunities to comment on the proposed undertaking if there is an adverse effect to an eligible Historic Property. The lead agency must examine

whether feasible alternatives exist that avoid eligible cultural resources. If an effect cannot reasonably be avoided, measures must be taken to minimize or mitigate potential adverse effects.

A qualified USACE archaeologist conducted research and a field investigation of the Project area to identify any potential historic properties, archaeological resources, or resources that are culturally significant. USACE initiated consultation with the SHPO and the Confederated Tribes of the Chehalis Reservation, Hoh Indian Tribe, Quileute Tribe of the Quileute Reservation, Quinault Indian Nation, and Shoal water Bay Indian Tribe of the Shoal water Bay Indian Reservation on May 19, 2025, with an Area of Potential Effects (APE) letter. The Quinault Indian Nation responded to the letter and conveyed that there were no specific concerns and would like USACE to ensure that the construction crew has an inadvertent discovery plan on hand. USACE intends to create such a plan and instruct the construction crew to follow it. USACE received APE concurrence from SHPO on May 19, 2025 (Appendix B.4). On July 17, 2025, USACE provided the SHPO with all necessary NHPA documentation for consultation. The SHPO concurred with USACE's determination of no historic properties affected for the proposed project on July 17, 2025, with the stipulation of the inclusion of an inadvertent discovery plan (Appendix B.4). USACE will include such a plan in the final construction plans.

10.12 AMERICAN TRIBAL TREATY RIGHTS & TRIBAL CONSULTATION UNDER EO 13175, CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

In the mid-1850s, the United States entered into treaties with many Native American Tribes in the Northwest. These treaties guaranteed the signatory Tribes the right to "take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory" [*U.S. v. Washington*, 384 F. Supp. 312 at 332 (WDWA 1974)]. In *U.S. v. Washington*, 384 F. Supp. 312 at 343 - 344, the court resolved that the Treaty Tribes have the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than *de minimis* effects to access to usual and accustomed fishing area may violate this treaty right [*Northwest Sea Farms v. Wynn*, F. Supp. 931 F. Supp. 1515 at 1522 (WDWA 1996)]. In *U.S. v. Washington*, 759 F.2d 1353 (9th Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined on a case-by- case basis. The proposed action would not cause significant effects to Tribal treaty rights, Tribal consultation, and consultation and coordination with Tribal governments. Therefore, this Project meets the requirements of the EO.

10.13 EXECUTIVE ORDER 11988 FLOODPLAIN MANAGEMENT

Executive Order 11988 requires Federal agencies to avoid, as much as possible, both short- and long-term negative impacts from occupying or changing floodplains. It also directs agencies to avoid directly or indirectly encouraging development in floodplains when a practical alternative exists.

USACE evaluated the potential effects of the TSP on floodplain management in the study area, following the procedures outlined in ER 1165-2-26 (Implementation of Executive Order 11988 on Floodplain Management). This Executive Order includes eight steps that guide the decision-making process. A summary of those steps and USACE's responses is provided below.

Step 1. Determine if the proposed action is in the base floodplain.

The proposed actions are located in the base floodplain for the Chehalis River.

Step 2. If the action is in the floodplain, identify and evaluate practicable alternatives to locating in the base floodplain.

The main goal of the Project is to protect against streambank erosion. Because of this, there are no practical alternatives located entirely outside the base floodplain that would meet this goal—except for the no action alternative.

As part of the flood risk management analysis for the TSP, described in Chapter 7 and the Economics Analysis presented in Chapter 5, the study team also examined residual risks. Their findings show that the TSP is the best option for reducing environmental impacts while also lowering flood risks to people and property along the Chehalis River.
Step 3. Provide public review.

The proposed project involves ongoing coordination with the public, government agencies, and other interested stakeholders. This draft IFR/EA is being released for a 30- day public review period, as required under NEPA.

Step 4. Identify the impacts of the proposed action and any expected losses of natural and beneficial floodplain values.

Chapters 4, 5 and 6 of this document present an analysis of alternatives. Practical measures and options were developed, and their potential impacts and benefits were assessed using both qualitative and quantitative methods. The expected impacts of the recommended plan are summarized in Chapter 7 of this report.

Step 5. Minimize threats to life and property and to natural and beneficial floodplain values. Restore and preserve natural and beneficial floodplain values.

Implementing the recommended plan would help reduce the effects of flooding on human health, safety, and welfare at the JDC. USACE does not expect the Project to encourage additional development in the floodplain beyond what is already anticipated under the FWOP condition, as described in Chapter 3.

Step 6. Reevaluate alternatives.

Chapters 4, 5 and 6 of this draft IFR/EA present an analysis of alternatives and their impacts. For the features included in the recommended plan, there are no practical alternatives

located entirely outside the base floodplain that would meet the study's objective of protecting against streambank erosion.

Step 7. Issue findings and a public explanation.

The public will be informed through a public notice and involvement process under NEPA that there is no practical alternative to placing the proposed action within the floodplain. This fulfills the requirement outlined in Item 3 above.

Step 8. Implement the action.

On its own, the proposed Project does not lead to more development in the floodplain and does not raise flood risk. The recommended plan aligns with the requirements of this Executive Order.

10.14 EXECUTIVE ORDER 11990 PROTECTION OF WETLANDS

Executive Order 11990 encourages Federal agencies to take steps to reduce the destruction, loss, or damage of wetlands, and to protect and improve their natural and beneficial values when carrying out Federal activities and programs. Further analysis and alignment with the overall wetlands policy in this Executive Order will be addressed through compliance with Section 404 of the CWA and USACE's preparation of the CWA 404(b)(1) evaluation in the D&I phase.

10.15 EXECUTIVE ORDER 13175 CONSULTATION AND COORDINATION WITH INDIAN TRIBAL GOVERNMENTS

Executive Order 13175 (November 6, 2000) reaffirmed the Federal Government's commitment to maintaining a government-to-government relationship with Indian Tribes. It directed Federal agencies to establish procedures for consulting and working with Tribal governments when new regulations may affect Tribal interests.

USACE follows a government-to-government consultation policy to support meaningful exchanges between decision-makers and reach mutually acceptable outcomes. On July 25, 2025, USACE sent letters to the Confederated Tribes of the Chehalis Reservation, Hoh Indian Tribe, Quileute Tribe of the Quileute Reservation, Quinault Indian Nation, and Shoal water Bay Indian Tribe of the Shoal water Bay Indian Reservation, requesting comments on the proposed Project.

So far, two responses have been received. The Quileute Tribe of the Quileute Reservation stated they have no comments or concerns. The Confederated Tribes of the Chehalis Reservation requested more information about Project impacts and asked whether an inadvertent discovery plan would be included. On August 12, 2025, USACE responded with details about the Project's impacts and confirmed that an inadvertent discovery plan would be part of the Project.

The draft IFR/EA will be shared with these Tribes for public review. Consultation and coordination will continue into the D&I phase of the Project.

11 SUMMARY OF ASSESSMENT

Alternative 3 (Terraced Riprap Berm) is the Preferred Alternative and serves as the TSP. It represents the least-cost option, with total expenses lower than relocating the facility, while offering greater net benefits than the other alternatives. The TSP would stabilize the streambank adjacent to the JDC, reducing the risk of future infrastructure failure and helping preserve critical facility operations. It is the most effective and economically efficient method of streambank bank stabilization, yielding approximately $233,700 in annual net benefits and a BCR of 6.64.

The design of TSP allows the existing security fence to remain in place; however, it requires shifting the toe of the slope into the river, which would result in some environmental impacts. To address these effects, the TSP incorporates features that improve water quality and habitat conditions, including native plantings, a constructed terrace, and anchored large woody material. The terraced riprap berm will extend approximately nine feet beyond the current streambank, with marsh vegetation planted on the terrace and additional native vegetation above it. LWM will be placed at the toe of the slope, and all mitigation measures will be implemented onsite.

Construction will be completed in a single season using standard shoreline armoring techniques tailored to site-specific erosion forces. The Project will follow best management practices to minimize short-term disturbances and includes long-term ecological enhancements. Although no compensatory mitigation under the CWA is proposed, the plan incorporates avoidance, minimization, and restoration measures consistent with NEPA guidelines. The cost estimates for the alternatives include contingency funds for compensatory mitigation under Fish and Wildlife Facilities (Appendix C). Should compensatory mitigation be required, it will be incorporated into the final Project.

The feasibility study confirms that streambank protection for the JDC is within Federal interest under Section 14 authority and aligns with NED goals. The recommended plan meets all planning criteria and will provide stabilization benefits over a 50-year period of analysis.

USACE has determined that the proposed Project does not constitute a major Federal action significantly affecting the human environment and, therefore, has prepared IFR/EA. Public comments are invited on the draft IFR/EA and the draft FONSI.

12 DISTRICT ENGINEER'S RECOMMENDATION

This report presents recommendations based on currently available information and existing Departmental policies for developing individual projects. These recommendations do not account for national Civil Works program priorities or budget considerations, nor do they reflect the views of higher-level review within the Executive Branch. As such, they may be subject to change before final approval. If any modifications are made prior to transmittal to higher authority, the NFS, relevant state agencies, federal partners, and other interested parties will be notified and given an opportunity to provide additional input.

The following language presents USACE's recommendation for project approval and authorization to proceed with implementation.

Having given full consideration to the environmental, social, and economic effects of the proposed action—as well as its engineering feasibility, financial viability, and all other elements bearing on the decision in the overall public interest—I recommend approval of Alternative 3: Terraced Riprap Berm as the TSP or recommended plan for the Grays Harbor JDC Emergency Streambank and Shoreline Protection Project, as generally described in this report. This alternative would stabilize the streambank using an armored slope with a terraced feature. The riprap toe and terrace would extend approximately nine feet beyond the existing streambank toe. The terrace would be constructed near mean low water and planted with marsh vegetation. Additional native vegetation would be planted above the terrace, outside the 15-foot clear zone. LWM would be placed at the toe of the slope. This alternative includes onsite mitigation for environmental impacts. I recommend implementation of this plan, with such modifications thereof as in the discretion of the Commander, HQUSACE, may be advisable.

Based on October 2024 (FY25) price levels, the estimated first cost to design and construct the TSP is $988,000. The fully funded total project cost is $1,088,000, which includes the first cost plus inflation and anticipated cost escalation through the midpoint of construction. While the first cost is used for most analytical purposes, cost-sharing decisions are based on the fully funded total project cost.

The Federal share of the total project cost is 65% ($707,200), and the NFS's share is 35% ($380,800). For the first cost, the Federal share is $642,200, and the non-Federal share is $345,800.

KATHRYN P. SANBORN, PhD, PE, PMP

COL, EN Colonel, Corps of Engineers

Commanding District Commander

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